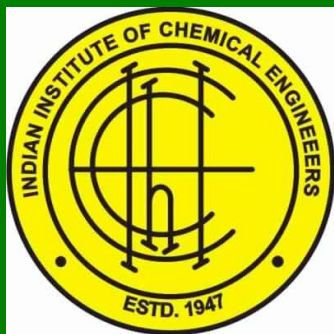


IICHE-MRC E-NEWSLETTER

MUMBAI REGIONAL CENTER



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INDIAN INSTITUTE OF CHEMICAL ENGINEERS
Mumbai Regional Center, B-18 Vardhman Complex,
Gr Floor, Opposite Home Town & 247 Park, LBS Marg,
Vikhroli (West), Mumbai - 400 083

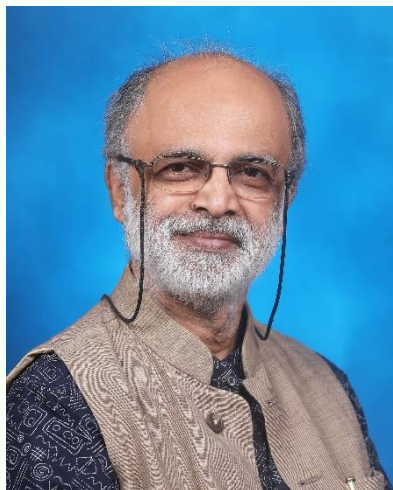
IICHE-MRC EXECUTIVE COMMITTEE

2021-23

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FROM CHAIRMAN'S DESK

Prof. Aniruddha B. Pandit
Chairman IICChE-MRC

My Dear Friends,

Let me start with congratulating all of you that IICChE is celebrating Platinum Jubilee year in 2022 in coincidental sync with Platinum Jubilee of India's Independence as we are ready for forthcoming grand celebrations to commemorate the 75th anniversary of Independence. IICChE platinum jubilee is right time to acknowledge the contribution of IICChE members in last 75 years and be prepared to meet the fresh industry expectations.

As the year 2022 is progressing, there is optimism in the air. We have already shown our confidence by administrating more than 200 crore covid vaccine doses. Risks are not strong enough to deny India an economic rebound given the domestic demand potential. Good number of Businesses have seen a steady growth over the past year and are ready for fresh investment. Inflation has been hard on low-income households however number of flights taking off and hotel reservations have enthused travel industrialists. Demand for electricity in 2022 is higher. The number of vehicles registered has reached pre-pandemic levels. Additionally, if the global economic slowdown results in a fall in commodity prices, Indian import bills will also come down and will improve India's finance. It is true that uncertainties in the global business will affect India but the optimism about our economic recovery, even if somewhat damaged, remains intact.

For *Atma Nirbhar Bharat*, Chemical engineers have vital role to play with regards to manufacturing of highly hazardous chemicals which have been mostly imported, which are resource intensive and having large environmental footprint. Indian Institute of Chemical Engineers (IICChE) is the premier professional organization providing industry and academic interactions for professional growth. IICChE-MRC continues to conduct and support many online & hybrid events. I wish this issue of e-Newsletter too proves beneficial to the member community to encourage them to collaborate and rededicate ourselves on this 75th anniversary of the Nation and the IICChE, for a better world.

Wishing all of you best of reading.

Prof. Aniruddha B. Pandit

EDITOR'S CORNER



Dear Readers, Greeting !

Let me first wish all the best to all of you on occasion of coincidental synching of Platinum Jubilee year for IChE and India's Independence. I am happy to share yet another issue of IChE-MRC Newsletter with very informative, and thought provoking technical article on 'Role of Chemical Engineers to Achieve an Excellence in Safety of Chemical and High Hazards Industries' by Shri Joy M. Shah. It is my pleasure to present glimpses of recent events including Prof. NR Kamath quiz, ACMS-2022, MRC meetings and webinars. The respective lectures and events are available on MRC website and U-tube. We would like to thank readers for their honest feedback on previous issues of E-Newsletter. Simplicity is the trademark of IChE-MRC style, so is our E-Newsletter. Looking forward to your valuable comments and contributions.

Single-use plastics has been banned from July-22. We need to see that the waste plastic material is recycled or incinerated, and it has not reached landfills or choked our waterbodies. The reuse or disposal is done in environment friendly manner and not creating more pollution or health hazard for the workers and people in vicinity. Chemical engineers have the big role to play in recycling of the waste material. Millions of poor people working in the unorganised sector who manage to make value out of our refuse are the real waste warriors. It is time we should not use banned items and ask for more such items to be banned, because we must and can live without them.

With regards to CO₂ emission, India is the third, just behind China and US. India has been taking steps and are visible. India is neither top polluter nor have high per capita emission, but it is better to start early. Our top contributors are power about 40%, Steel & Cement about 25%, transportation and agriculture each about 15%. Many Industries have implemented renewable energy projects. These new challenges provide significant opportunity for chemical engineers to innovate emission compliant products and energy alternatives.

Globalisation has changed economies and as a result millions of people were able to upgrade to the middle class. But recent epidemic have exposed the global interdependency. Downturn in stocks, inflation, Ukraine war, and confrontation between US & China have affected many Industries. Allegations of financial lapses have added to the challenges. Changes in supply chains and trade patterns are also witnessed. In light of above and for Atma Nirbhar Bharat, Chemical engineers have big role to play in repositioning of Chemical Process Industries.

I take the opportunity to thank editorial team, advisory committee, Chairman IChE-MRC and specifically Prof. Vinay Srivastava Sir for guiding and help editing the newsletter. Let us grow and evolve as we undertake this journey together. Happy reading! Take Care, Stay Safe !!

Jagdish Nageshri
Editor, IICHE-MRC e-Newsletter

Indian Institute of Chemical Engineers (IIChE) Platinum Jubilee Year 2022



It is not a mere coincidence that Indian Institute of Chemical Engineers (IIChE) is commemorating its Platinum Jubilee year in 2022 while the Nation is up and ready to launch grand celebrations to commemorate the 75th anniversary of India's Independence.

IIChE began its journey on 18th May 1947 with burning nationalistic fervor as India was on the cusp of gaining its independence in August 1947. Ever since its inception, the mission of IIChE was to contribute to the nation-building through dissemination of knowledge and enhancement of skill in Chemical Engineering and its allied fields. While the path has not always been easy, IIChE has been steadfast in its role.

Today it has emerged as a premier body of Chemical Engineering education and profession in India, having over 30,000 members across the country. The year-long Platinum Jubilee celebration of IIChE is a means to toast its 75-year long journey through many successes and a few setbacks.



'Role of Chemical Engineers to Achieve an Excellence in Safety of Chemical and High Hazards Industries'

- JOY M. SHAH

"Accidents are not caused by lack of knowledge, but by a failure to use the knowledge that is available". – Trevor Kletz

The Chemical, Hydrocarbon and High Hazards Industries are highly integrated complex. It handles variety of Chemicals and some of them are highly toxic, highly flammable and highly reactive as well as complex unit processes and unit operations make it more vulnerable for an accident.

We have seen several high impact accidents in leading Industries. Few of them are listed below having loss of more than US\$ 1 billion in single accident.

1. Incidental release of MIC in India on 2nd Dec 1984 killing several innocent people;
2. Chernobyl nuclear plant disaster in USSR on 26th April, 1986,
3. Fire and Explosion in Piper Alpha at North sea, UK in 1988,
4. Fire and Explosion at HDPE plant at Pasadena, USA in 1989
5. Fire and Explosion in Gas Processing plant at Longford Victoria, Australia in 1998
6. Huge explosion at Fertiliser plant at France on 21st Sept, 2001,
7. Fire and Explosion at Texas city refinery on 23rd March 2005.
8. RFCC fire at Refinery in UAE in 2017
9. Fire and Explosion at Jiangsu in China in 2019 and many more

None of the continent is free of such high impact incidences. Therefore, several measures are taken in improving design and practices of various aspects of chemical industries over last three decades. Occupational Safety and Health Administration (OSHA) have developed Process Safety Management Standards in 1992 in response of nos of catastrophic chemical release incident worldwide and getting them revised periodically. Industries, esp. Hydrocarbon and Chemical companies have absorbed these standards and guidelines to improve their facility design and work practices. Every function and position is evolving to identify their additional role for safety in such a high hazard industry.

Chemical Engineers are employed by these industries and are working in many different roles. The roles starting from Graduate Engineer trainee to in various position in different departments e.g. Project, Commissioning, Operation, Technical Services, HSEF, Procurement, Marketing, Supply Chain, R & D and up to the position of Site Head, President, CEO as well as Managing Director of the Company.

Again, Chemical Engineer is very critical role from Conceptualisation of the project to Mothballing of any high hazards facility, i.e. throughout life cycle of any chemical plant and / or industry. It is observed that they are the most versatile engineers, emerges as leader and can contribute a lot to improve safety. Some of the areas are identified in this article based on my extensive experience in Petrochemical and Hydrocarbon Industry.

Continued...

Introduction of Safety:

Safety is normally three dimensional approach, viz.

1. Work place safety
2. Process Safety and
3. Behavioural-based Safety

Work place safety refers to the limitation of the elements that can cause harm, accidents and other negative outcomes in the workplace. It affects directly to the employee's productivity and well-being, and hence deteriorate quality of product and increase vulnerability to risk. Some of the examples are Electrical hazards, Exposure to dangerous chemicals, Machinery and tool hazards, Small fire incidents, Psychological hazards, Ergonomic Hazards and health of workers.

Process safety incidents refers to unexpected and accidental release of toxic, reactive or flammable gas or liquid to atmosphere and leading to fire, explosion and catastrophic damage to Property, People and Planet. There are 14 elements of Process safety management standards, viz. Process Technology, Operating procedures and standard practices, Management of change, Process Hazards Analysis, Pre-start up safety review, Quality assurance, Mechanical Integrity, Management of Subtle change, Management of personnel change, Incident investigation, Contractor Safety, Training, Emergency Response and Planning as well as Audit.

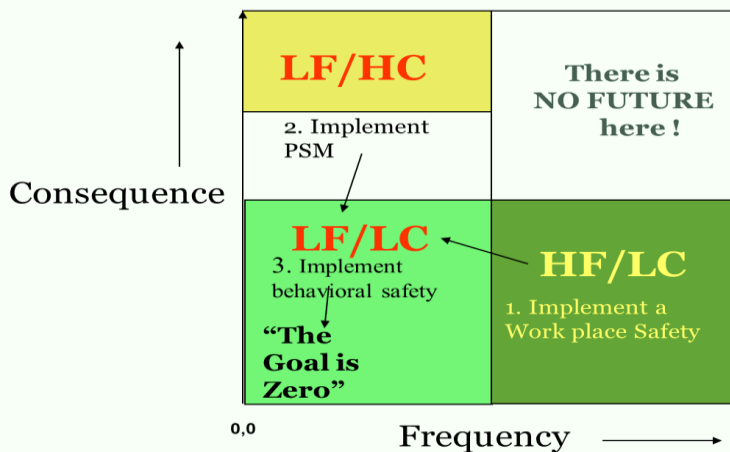
Behavioural-based Safety refers to an approach to applying behavioural psychology to encourage safety in work place. It is a process that creates a safety partnership between management and an employee that continually focuses people's attention and action on theirs and others daily safety behaviour. It starts with identification of critical behavioural problem, its root cause analysis, develop action plan, implement them and follow up to achieve results.

When all of these dimensions are in place in any of the chemical or high hazards industry, we can achieve excellence in safety and avoid any minor and major incident.

Normally, consequence of Work place safety incidents is low whereas consequences of Process safety incidents are high. On the contrary, frequency of occurrence of incidents related to work place safety are very high whereas frequency of occurrence of process safety incidents are low. By implementation of work place safety standard and process safety standards, both frequency of occurrence of work place safety incidents as well as consequence of process safety incidents can be reduced but cannot be made zero. As shown in Fig.1, to achieve GOAL ZERO INCIDENT, behaviour based safety standards to be embedded in culture of the organisation to achieve GOAL ZERO.

Continued...

Fig 1: Managing Risk



Role of Chemical Engineers to achieve Excellence in Safety

For Excellence in safety, Technical systems and Human capabilities are pulled in tandem which results in to involvement of all minds on board and develop culture of high performance and continuous improvement.

Excellence in safety is multi-pronged, multi-functional frame work. Only chemical engineer cannot achieve it, although they can lead the multi-functional team in various areas of manufacturing to achieve an excellence.

The most important and priority focus is considered as Safe Operation. Safe operation cannot be achieved without Total Employee Involvement. Therefore, I have considered two most important pillars where Chemical Engineer can contribute for safety of Chemical plant. Viz.

1. Risk identification and control
2. Lead Total employee involvement

Firstly, Chemical Engineer can provide a third eye for identifying risk and threat for chemical industry, assess the impact and consequences of the risk as well as provide mitigation and management measures to manage risk associated with the facilities by using various techniques and tools and processes as shown in Fig 2.

Role of chemical engineers are described below for all these tools and techniques.

1. **Process Safety Management** – There are 14 nos of elements. Chemical engineers can understand the Intent and purpose of various elements, carry out Process Design of MOC- Technology as well as MOC- Subtle, carry out HAZOP study as well as Risk assessment, lead PHA of the facility, maintain and update Process Technology Documentation and ensure that the plant is designed as intended, become a team member of PSSR team, be a team member of Quality Assurance and Mechanical Integrity team/ Corrosion loops monitoring team / PSM critical equipment identification team, Lead the team to identify the right operating limits meeting design intent, identify deviation from operating limits and recommend

Continued...

Fig 2: Techniques for Risk Identification



corrective actions, be a team member or team leader for Incident investigation, assist in development of Emergency response plan as well as support PSM auditing to ensure that the procedure of PSM is followed. Chemical Engineers can review the operating procedure for integrity and technical feasibility.

2. **HTM guardian** – Chemical Engineer is expected to be knowledgeable for the Highly toxic material handled in Chemical Industry where he is serving. He can prepare the design and operating manual for HTM, review every HTM related changes, training of operating personnel for HTM related risk and emergency action. In short, he can act as an HTM guardian. Any major development and improvement taken place in the world, he is expected to know and check for its applicability.
3. **Safety Integrity Level (SIL) study** – Chemical plant is normally designed by Engineering contractor and Licensors. The control and interlock is based on their understanding and location. Chemical Engineer is expected to carry out SIL study of the plant w.r.t. operating condition and identify SIL requirement for various controls and interlocks based on expected risk and loss. This will ensure that the plant is safe to operate and action will be taken for safety as and when in demand.
4. **Layer of Protection Analysis** – LOPA is the Semi-quantitative method for identifying and evaluating the effectiveness of independent protection layers in reducing the frequency and/or severity of hazardous events. Chemical Engineer can lead or work as a team member for this analysis as they have to support for
 - i) Scenarios identification.
 - ii) Select an accident scenario.
 - iii. Identify the initiating event of the scenario and determine the initiating event frequency (events per year).
 - iv. Identify the IPLs and estimate the probability of failure on demand of each IPL.
 - v. Estimate the risk of scenario.

Continued...

5. **Alarm Rationalization.** The role of the alarm system is to notify operators of the exceedance of any defined critical, standard or target limit or the condition when the process is not behaving as expected or when other threats have impacted operations. The notifications are designed to initiate documented, predefined operator responses to the abnormal situation, either to bring the process back to the targets, or to prevent exceedances of equipment constraints. The operator is empowered to manage abnormal situations through actions that stabilize, slow down or shutdown the process. Nos. of alarm per panel operator is the most important KPI for safe operation. Eliminating all nuisance alarm to make Panel operator free from unwanted crisis and defining the correct alarm and alarm limit is function of Chemical Engineer. The most important aspect of reviewing the top alarms on daily basis & managing the alarm limits to facilitate panel operators to concentrate on real issues is function of Chemical Engineer.

Chemical Engineer also improves process reliability by

1. Review of existing SOP & development of new SOP
2. Define Operating Window for parameters (SOC)
3. Troubleshooting during any process upsets.
4. Review of raw material & product specifications.
5. Avoiding repeat failures by analyzing root cause of any process failure.
6. Inherently safe Process design.

In addition to this, when in management position; Chemical Engineer have to ensure that sufficient resources are provided, documentation of the project is up to date as well as ensure training the operating staff.

Thus Chemical Engineers aid excellence in safety by identification and control of risk, supporting safe, reliable and compliant operation to reduce incidents, process failures and ensure operation is within safe operating boundaries. **Secondly**, 100% safety cannot be achieved without involvement of each individual as well as training to the employee, whether it is permanent or contract; Technology, Operation, maintenance, safety or commercial, Front line to Apex member etc.

Some of the area where Chemical Engineer is driving people involvement to achieve Excellence in safety are ...

1. PHA / SIL / QRA / RCA / Alarm Rationalization study: Chemical Engineer is normally a team leader for these studies, chemical engineer provides all process knowledge for various study. Prior to team building, chemical engineer is imparting training or ensure that the team members are trained for this study. At every stage of study, they provide input as well as try to extract best out of the available knowledge to assess the safety, risk as well as identify action plan.

Continued...

2. **Technology Networking:** Networking is the most important requirement for safe and secured operation. Chemical Engineer is expected to keep all like-minded and like expertise people informed, participate in conferences, carry out various networking meeting, share knowledge as well as drive the activity towards excellence.
3. **Learning from Incidents and Failures:** Chemical Engineers are expected to drive team of incident investigation to identify root cause and corrective actions to avoid repeat of incidents.
4. **Tripod team:** Providing technical inputs as a member of Tripod team for identification of corrosion loop, Chemicals corrosion mechanisms & monitoring key parameters for safe & reliable operation.
5. **Shutdown Support:** Carry out inspection and provide action plan for increasing time between two turn around in consultation with Maintenance, Operation and safety functions.

Safety Improvement Opportunities: Chemical Engineer carry out brain storming session with operation and maintenance engineers to identify Reliability, safety improvement scheme. They develop, design and support execution with the objective of best in class operation.

Conclusion: Chemical Engineer aid in Excellence, Safety and Sustainability by improving knowledge base, involve all employee & ensure flow of right information at right place for safe operation.

In conclusion, Chemical Engineer can be back bone of Excellence in Safety and also provide leadership for safe and sustainable operation of Chemical and High Hazards Industries.

“For a long time, people were saying that most accidents were due to human error and this is true in a sense, but it’s not very helpful. It’s a bit like saying that falls are due to gravity.” - Trevor Kletz.

ABOUT THE AUTHOR

The author is Founder and Chief Consultant, Innov8 ProTech Solutions, The Sustainability and Management Consultant. Since last four years, he is consulting for Energy and Water Management, Green company advisory and branding, Sustainable Manufacturing as well as Process Safety and Risk Management.

Formerly, he was Sr. Vice President (Head- Technical, Energy and QA/QC) at Reliance Industries Ltd. He is also a member of the IICChE Chemical Process Safety, Energy and Environment Committee since 2018 as well as member of Industrial Safety and Security committee of SGCCI since 2020

The author holds following degrees and certifications. B.E. (Chem.), C. EA, F.CMA, IGBC AP, ISO50001:2018 Auditor, Early Professional in Climate change and Environment Sustainability), Finalist of Indian Climate Change Champion League 2020.

Email: shahjoym@hotmail.com; Mob: +919374715109

Glimpses of Prof. N R Kamath Chemical Quiz Competition 2022 Institute of Chemical Technology, Mumbai. 20th March 2022

On the occasion of IChE Platinum Jubilee Celebration, Indian Institute of Chemical Engineers Mumbai Regional Centre in association with Institute of Chemical Technology (ICT), Mumbai Organised Prof NR Kamath Chemical Engineering Quiz Contest at KV Auditorium of ICT Mumbai on 20th March 2022.

Nine college teams participated in the event. Shri Praveen Saxena, Registrar IChE & Director & CEO Blast Carboblocks, Prof Bhagwat, Prof Rathod, Prof Manish Yadav from ICT, Prof Jogwar from Indian Institute Of Technology Bombay, Shri Dhawal Saxena Hon Secretary MRC, Shri Pratik G Bhagat Jt. Secretary MRC were present during the celebration.



Continued ...

WINNERS TEAMS

1st Prize

S/Shri/Ms

Ashish Arun Jaiswal

Gayatri Sanjay Nalawade

Mohammed Saud Ismail Shaikh

Thadomal Sahani Engineering College
Mumbai.

Prof. Dr Elizabeth Joseph, HOD, CED

1st Runner up

S/Shri/Ms

Vaibhav Mishra

Kartik Karanth

Khushi Veerothi

Dwarkadas Jivanlal Sanghvi College of
Engineering

Ms Rupali Karande, Head CED

2nd Runner up

S/Shri/Ms

Shreyam Mishra

Ananya Burli

Akshat Shirish Zalta

Indian Institute of Technology Bombay

Prof. Madhu Vinjamur, Head CED



Glimpses of ACMS - 2022

**International conference on Advances in Chemical and Material Sciences
Heritage Institute of Technology Kolkata. 14-16 April 2022**



The banner features the IICChE logo on the left and a '75' anniversary logo on the right. The central text reads: 'IICChE Celebrating Platinum Jubilee Year - 2022 & International Conference on Advances in Chemical and Materials Sciences (ACMS-2022)'. Below this, it states '(Hybrid Mode: Offline and virtual participation) 14-16 APRIL 2022'. The organizers listed are 'Indian Institute of Chemical Engineers, Headquarters' and 'In association with National Institute of Technology, Jalandhar, Heritage Institute of Technology, Kolkata, And Osmania University College of Technology, Hyderabad'. At the bottom left, it says 'Separate Technical Session for the UG and PG students'. The bottom right features logos for IIT Kharagpur, IIT Jalandhar (celebrating 20 years), and Osmania University.

International conference on Advances in Chemical and Material Sciences (ACMS-2022) was aimed to bring together scientists, researchers and industrialists from academic and industrial sector to exchange the knowledge and share their experiences and latest research outcomes about all aspects of Chemical and Materials Science. ACMS 2022 has also mark the inauguration of the Platinum Jubilee celebration of IICChE.

To mark the beginning of its Platinum Jubilee celebration, the Indian Institute of Chemical Engineers (IICChE) organized the International Conference, ACMS-2022 during 14 - 16 April 2022 at the Heritage Institute of Technology (HIT), Kolkata. The conference was held in association with three premier technological institutes of India, namely, HIT, Kolkata; NIT, Jalandhar and Osmania University, College of Technology, Hyderabad. During the conference, it was deliberated to explore the new areas of Chemical Engineering and Materials Sciences, like Nanotechnology, Bioengineering, Environmental Chemistry, AI, etc., and to translate the knowledge into practicable technologies for development and prosperity with a human face.

ACMS-2022 was planned with a view to bring together people from the fields of Chemical Science and Material Science, for exchanging knowledge. The objective of this meet was to touch upon as many spheres so that certain priority areas could be shortlisted. Over the three days of the meet, five Key Note lectures, 23 Invited Lectures and as many as 32 Parallel Sessions were conducted with over 550 papers being presented, which were selected out of 670 papers.

Continued ...



The inauguration of the conference was a grand affair in the presence of the Chief Guest, Shri Rameshwar Teli, the Union Minister of State for State for Petroleum & Natural Gas and Labour & Employment; the Guests of Honour, Smt. Annpurna Devi, the Union Minister of State for Education; Padmashri Prof. (Dr.) G. D. Yadav, National Science Chair (Govt. of India), Former J C Bose National Fellow and Former Vice Chancellor, ICT Mumbai; Shri Subhesendu Chatterjee, Whole-time-Director, Haldia Petrochemicals Ltd, Prof. (Dr.) A.S.K. Sinha, Director, Rajiv Gandhi Institute of Petroleum Technology, Amethi, and Shri Vikram Swarup, MD, Paharpur Cooling Towers Ltd. Dignitaries of IICHE including President of IICHE, Shri D.M. Butala, and the Honorary Secretary of IICHE, Dr. Avijit Ghosh, who was also the Organising Secretary of ACMS-2022 and dignitaries from HIT, Kolkata were present on the podium during the inaugural event.



Continued ...

Invited Lectures and the technical papers were presented under five broad heads, that is (i) Material Science and Engineering, (ii) Advanced Chemical Engineering, (iii) Biochemical Science and Engineering, (iv) Chemistry and Environment and (v) Carbon, Polymer and Composite. Invited Lectures were delivered by acclaimed academics & industry experts from premier universities, technological institutes, research organizations and corporate enterprises.

Key Note Lectures were delivered by Dr. U. Kamachi Mudali, Vice-Chancellor, VIT Bhopal, Dr. Vilash Sapkal, Vice-Chancellor, MGM University, Aurangabad, Prof. Suddhasatwa Basu, Director, CSIR-Institute of Minerals & Materials Technology Bhubaneswar, Prof. (Dr.) Dinesh O Shah, Professor Emeritus of Chemical Engineering, Dharmsinh Desai University, Gujarat, Dr. Diganta Bhusan Das, Reader in Porous Media, Dept. of Chemical Engineering, Loughborough University, UK.



Foundation Day Celebration of IChE 2022

IChE Headquarters Kolkata - 18th May 2022



75th Foundation Day Celebration of IChE

Organized by
Indian Institute of Chemical Engineers, Headquarters



18th May 2022 at 16:00 hrs

Please contact for any query:
iicheghfb@gmail.com /
9830752111

Chief Guest



Mr. K Venkataramanan
Director L&T Trust and Associate
Companies, Former MD and CEO of
Larsen & Toubro and Former President,
IChE

Guest of Honour



Mr. Ashok Panjwani
Executive Director at UPL
Ltd and Former President,
IChE

President



Mr. D. M. Butala
Former ED, GSFCE

Vice President, IChE



Prof. M. V Rao
RVR & JCCE, Guntur

Vice President, IChE



Prof. C. Karthikeyan
Annamalai University



<https://us02web.zoom.us/j/5310655737?pwd=dldlTWErTWpYd245alE0eWdlSkpXUT09>

Meeting ID: 531 065 5737

Passcode: 1234



Registrar, IChE



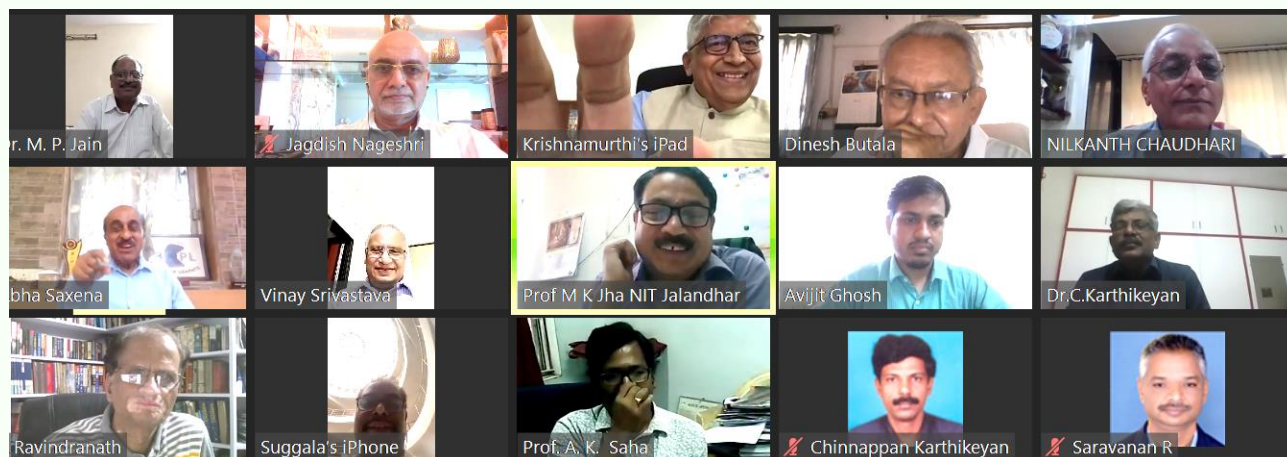
Mr. Praveen Saxena
Director & CEO
Blast Carbo Bolocks Pvt. Ltd.

Honorary Secretary, IChE




Dr. Avijit Ghosh
Heritage Institute of Technology

Foundation Day Celebration of IChE 2022 was organized by IChE Headquarters Kolkata on 18th May 2022 evening through online mode. Welcome Address was given by Shri D. M. Butala, (President, IChE). Prof. Dr. M. V. Rao, (Vice-President, IChE) and Prof. Dr. C. Karthikeyan, (Vice-President, IChE) also addressed the audience. Shri Ashok Panjwani, Executive Director at UPL Ltd and Former President, IChE was a Guest of Honour. Shri K Venkataramanan, Director, L&T Trust & Associate Companies, Former MD & CEO of Larsen & Toubro, and Former President, IChE was Chief Guest. Concluding remarks were given by Shri Praveen Saxena, Registrar, IChE. Vote of Thanks were given by Dr. Avijit Ghosh, Convener and Honorary Secretary, IChE.




Continued ...





Foundation Day Celebration of Indian Institute of Chemical Engineers




Join Zoom Meeting
<https://us02web.zoom.us/j/53119656737?pwd=Zm9kdTdlZWpYd2Z4eE0wZDhSc0pXUT09>


Organized by
IICHE Headquarters Kolkata

18th May 4 PM


Chief Guest



Mr. D. M. Butala
President
IICHE




Mr. K Venkataramanan
Director L&T Trust & Associate Companies, Former CEO & MD, L&T
and Former President, IICHE




Mr. Praveen Saxena
Honorary Registrar
IICHE


Guest of Honor




Mr. Ashok Panjwani
Executive Director at UPL Ltd
and former President, IICHE



Dr. Avijit Ghosh
Honorary Secretary
IICHE



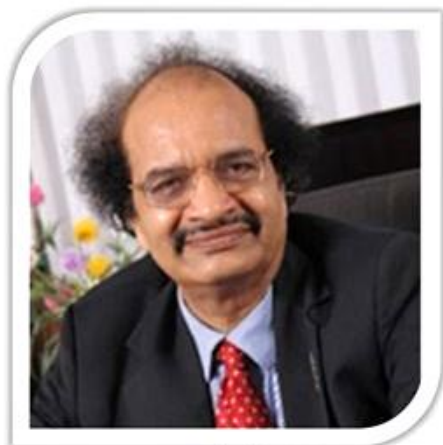
Prof. (Dr.) M. V. Rao
Vice-President
IICHE



Prof. (Dr.) C. Karthikeyan
Vice-President
IICHE

Talk on Hydrogen Economy by Prof. GD Yadav

Vishwa Manthan on 20th February 2022



Vishwa-Manthan and Garje Marathi Joint
Worldwide Webinar

Hydrogen economy and CO₂ refineries in pursuit of net zero goal

a conversation with

Prof. G. D. Yadav

Emeritus Professor of Eminence

Padmashri Awardee



Feb 20, 2022, Sunday

Indian ST: 06:00 pm

Singapore/China ST: 08.30 pm

US PST: 04.30 am

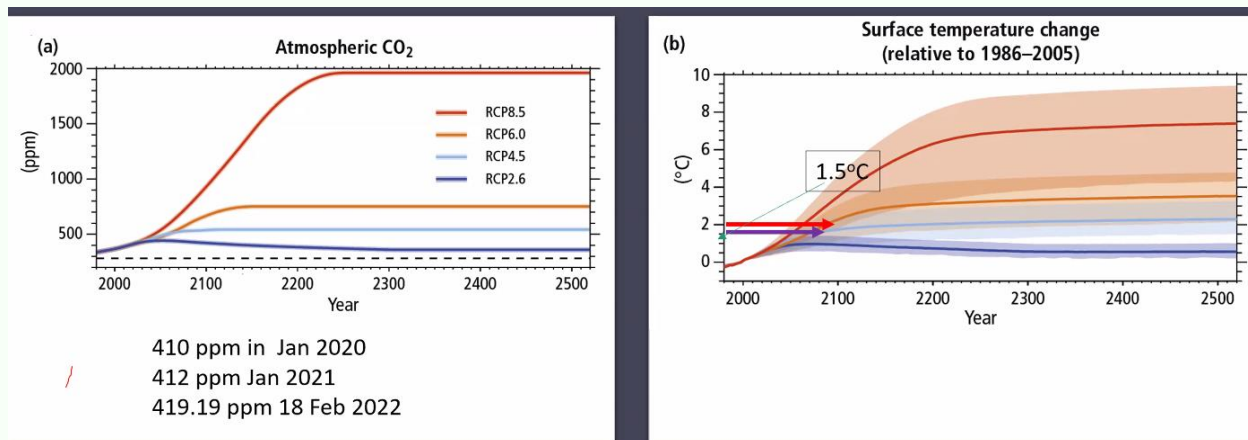
Central European Time: 01.30 pm

Five shades of hydrogen

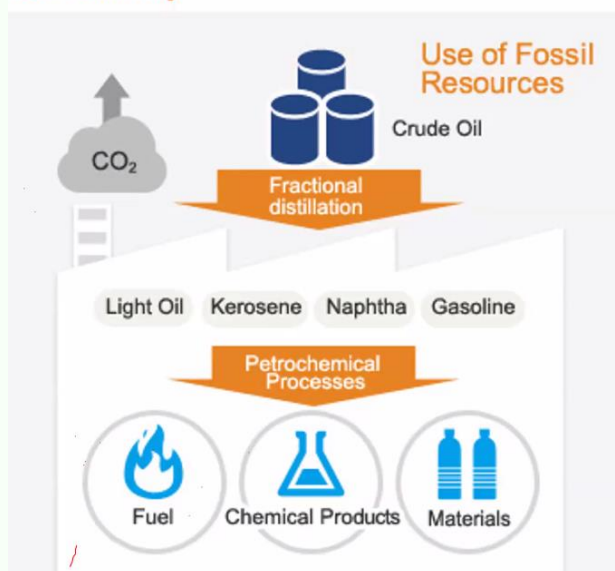
<p>Green</p> <p>Electricity from renewable sources is used to electrolyse water H_2O and separate the hydrogen H_2 and oxygen O_2</p>	<p>Blue</p> <p>Produced using natural gas via "steam reformation"; most of the greenhouse gas emissions are captured and stored</p>	<p>Turquoise</p> <p>Produced using natural gas via "pyrolysis" by separating methane into hydrogen H_2 and solid carbon dioxide CO_2</p>	<p>Grey</p> <p>Produced using natural gas via "steam reformation", but with no carbon capture and storage</p>	<p>Brown</p> <p>Produced using coal instead of natural gas, but with no carbon capture and storage; this remains the cheapest form</p>
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Brown	Grey	Blue	Green
Coal	Natural gas	Natural gas	Renewable electricity
Gasification No CCS	Steam methane reforming No CCS	Advanced gas reforming CCS	Electrolysis
Highest GHG emissions (19 tCO ₂ /tH ₂)	High GHG emissions (11 tCO ₂ /tH ₂)	Low GHG emissions (0.2 tCO ₂ /tH ₂)	Potential for zero GHG emissions
\$1.2 to \$2.1 per kg H ₂	\$1 - \$2.1 per kg H ₂	\$1.5 - \$2.9 per kg H ₂	\$3 - \$7.5 per kg H ₂

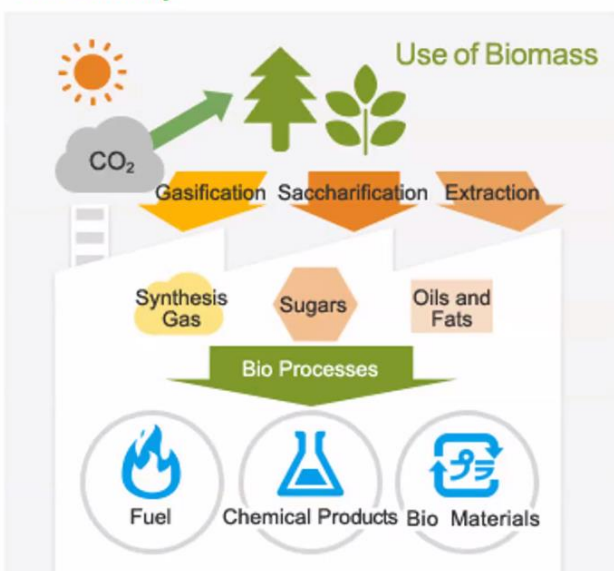
Continued ...



Oil Refinery



Biorefinery



Way Forward

Green Hydrogen will be the saviour of the world.

Hydrogen economy can be elegantly intertwined to make many chemicals from waste carbon sources including biomass and C1 off-gases.

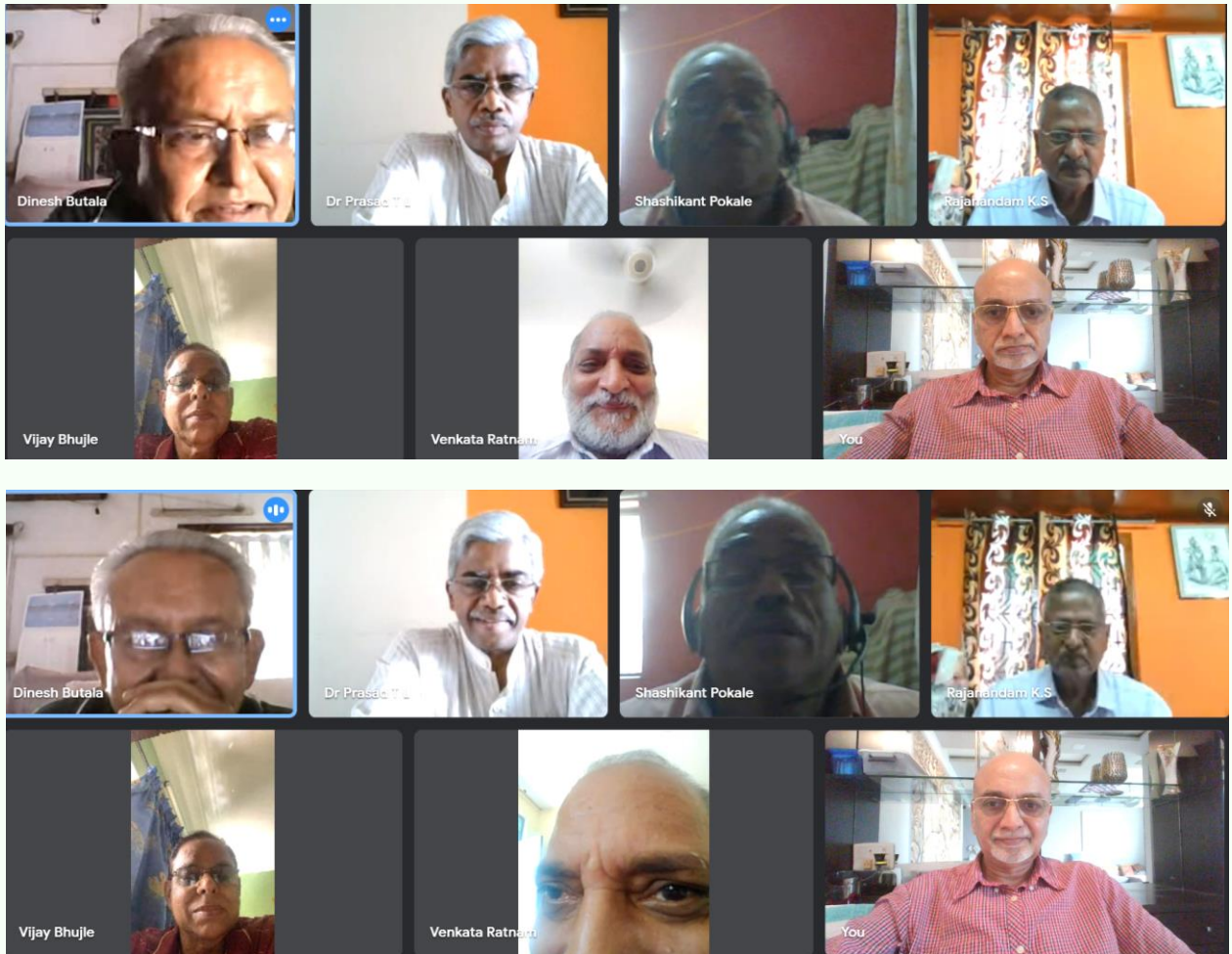
Govt of India should adopt hydrogen economy to meet the demands of the Paris Agreement.

ICT-OEC Hydrogen Production Technology is very promising at <USD~1.00

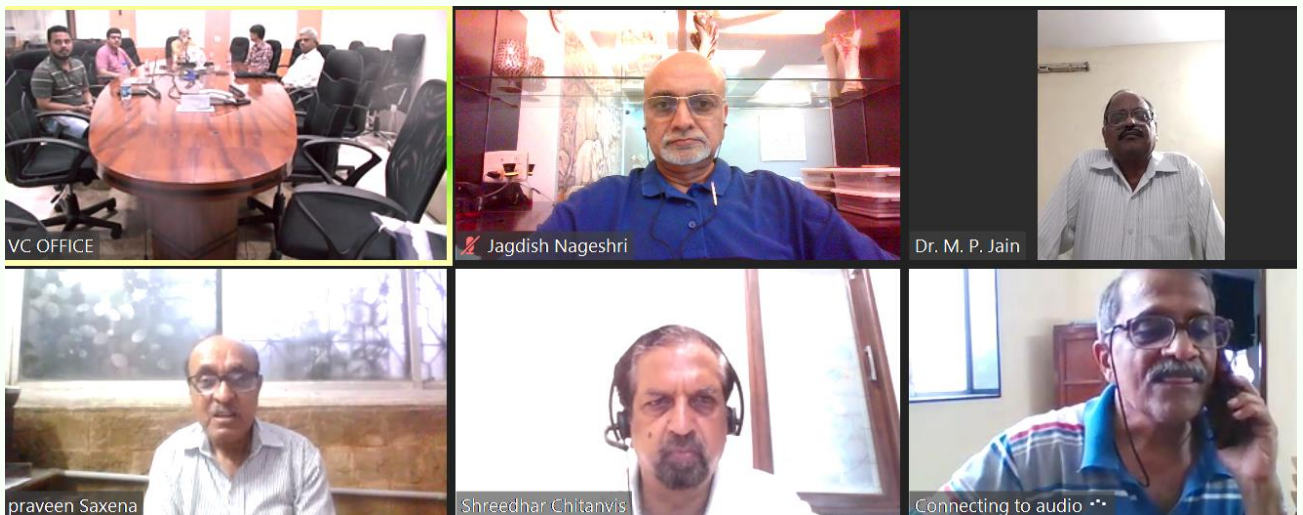
That is the only way to meet the goals of the Paris Agreement 2015.

We can MAKE IT.

PSEE (Process Safety Environment & Energy), IICHe Committee online Meeting on 12th June 2022



IICHE-MRC EC meeting on 23rd July 2022



RTSGT - 2022

Workshop on 'Recent Trends in Sustainable and Green Technology' NIT Srinagar on 28th June 2022

The workshop titled 'Recent Trends in Sustainable and Green Technology (RTSGT-2022) organized by the Department of Chemical Engineering in collaboration with IICHE Student Chapter NIT Srinagar. Experts during a workshop at National Institute of Technology (NIT) Srinagar said that there is a need to promote green technologies for a sustainable environment on earth and urged all stakeholders to join hands in this noble mission.

The inaugural event was presided over by Director NIT, Prof. (Dr.) Rakesh Sehgal and Prof. G.D. Yadav, Padma Shri Awardee, ICT Mumbai was Chief Guest on the occasion. Addressing the gathering, Prof. Yadav said there is a need to promote green technologies for a healthy and sustainable environment so that visible change can be seen on the ground. "Green technology comes in the form of recycling, renewable resources, health and safety concerns, energy efficiency, and more. There is a need to tackle the environmental concerns and promote green technology," he said. Prof. Yadav said the main objective of green technology is to use science and technology to protect natural resources and mitigate the negative environmental impact of human activity. Prof. C. Kartikeyan, Vice President (Guest of honour) said that green technology is crucial to preserve the environment. Currently, there is an urgent need to form a long-term sustainable investment mechanism for screening, evaluation, and promotion of appropriate green technology, he said.



Establishment of a Regional Centre of IICHe At NIT Srinagar on 02nd July 2022

Five days workshop on "Recent Trends in Sustainable and Green Technology" concludes at NIT Srinagar. The workshop was organized by the department of Chemical Engineering, under the aegis of IICHe - Student Chapter NIT Srinagar (J&K) and session started on 28th June, 2022. The workshop continued for five days, wherein lectures were delivered by professors and industrialists from all over the globe. The 2nd July, 2022 marked the conclusion of the five day long workshop, with the valedictory ceremony being held on the same day. The valedictory ceremony was followed by the council meeting of IICHe council members, **wherein the student chapter of IICHe at NIT Srinagar, was upgraded to the Regional Chapter.**



Honor for IChE

**Prof. G.D. Yadav Elected to the US National Academy of Engineering (NAE)
Heartiest congratulations to Prof. GD Yadav!!!**



Padma Shri Prof. (Dr.) G.D. Yadav, Emeritus Professor of Eminence, former Vice Chancellor, Institute of Chemical Technology, Mumbai and Past President, IChE has been elected to the **US National Academy of Engineering (NAE), USA** for his contributions to research, innovation, and teaching in Green Chemistry, Catalysis, Nanotechnology and Chemical Engineering. Prof. Yadav will be formally inducted into the NAE in Washington on 2 and 3 October, 2022. Till date, only 23 Indian nationals have received this prestigious membership in the history of NAE.

Back in India, Prof. (Dr.) Yadav has been selected as a **National Science Chair** by Science and Engineering Research Board (SERB), DST, Government of India for the period of 3 years. IChE-MRC earnestly wishes that Prof. (Dr.) Yadav earns many more accolades in his scholarly journey ahead.



Shri Praveen Saxena, Registrar, IChE sharing views in Entrepreneur meeting organised by CHEMTECH foundation during CHEMTECH Exhibition 2022 at JIO Convention Centre Mumbai on 10th June 22. In photo above L2R seen are Shri Pramod Khosla, CMD, Khosla Profil, Shri Yatinder Suri, former MD & Country Head, Outokumpu India Pvt Ltd, Ms Lekha Nirmal, Founder & CEO, P-Mech Technologies and ED P-Mech Consultant, Ms. Salony Luthara (Hollywood Actress turned Industrialist), Director, Sukhras Machines.

Honor for IChE

**Prof. Vinay K. Srivastava former President IChE and Scientist BARC
Receiving InDA - Life Time Achievement Award 2022 at Jodhpur on 26/3/2022
Heartiest congratulations to Prof. Prof. Vinay Srivastava !!!**

INDIAN DESALINATION ASSOCIATION
Registration No. 520/1991
(An Affiliate of International Desalination Association)



LIFETIME ACHIEVEMENT AWARD 2022

Prof. Vinay Kumar Srivastava



Prof. Vinay Kumar Srivastava born on 15th April 1954, did his B.E. Chem. Engg. in 1974, and M.E. Chem. Engg. in 1976, from HBTI, Kanpur. He has nearly 39 years' experience in BARC, Dept. of Atomic Energy as Scientific Officer. He also has 4.5 years as Associate Professor at MGM's CET, Kamothe, Navi Mumbai and about 2.5 years as an Adjunct Professor at IITB, Mumbai. He has specialization in field of Project Management of plan projects for Chemical Process & Desalination Plants, Lithium Enrichment for Strategic & IPR requirements; Thermal Desalination Technologies e.g. MSF, MED, MVC, TVC, LTE; Solar Desalination; Nuclear Desalination; Membrane Based Desalination e.g. RO, NF, UF for Brackish, Sea & Effluent Water Desalination; Electro-thermal Process for Production of Elemental Phosphorus using indigenous highly siliceous rock-phosphates and field deployments of quite a few Desalination & Lithium enrichment facilities in India and abroad.

Prof. Srivastava have affiliations with professional institutions and served as **President IChE**, 2018 and Life Member of IChE MRC since 1989, HQ, Kolkata, **Vice President InDA**, & I.M Indian Desalination Association since 1982, HQ, BARC, Life Member **Hindi Vigyan Sahitya Parishad**, BARC since 1978, Life Member **Indian Nuclear Society**, HQ, Mumbai, Life Member and Trustee **Indian Membrane Society**, HQ, Baroda, Chairman IChE MRC since 2011-2013. Prof. Srivastava have received many awards such as **Indo-US Science and Technology Fellowship**, 1994 (1-Year), Group Achievement Award for **NDDP Project** at Kalpakkam, 2009, Lifetime Achievement Award for the services in DAE, 2011, **Best Paper Award** in Chemcon-2003. He held various position in BARC, DAE like **Head**, Thermal Desalination Section, DD: April 2004 to August 2012; **Head**, Alkali Metal Section, ChEG: Sept.2012 to April 30, 2014; **Asso. Prof.**, Chem. Engg. Dept. MGM CET, Kamothe Aug.2014 to 31Jan 2019 & presently serving as **Adj. Professor** at IIT B.

He visited various countries for International Conferences and presenting papers. Visited 5 times to **International Atomic Energy Agency, Vienna**, Austria for International Conferences and Presentation on the work of Nuclear Desalination, visited once to **CZECH Republic** for International Collaboration work on Nuclear Reactor coupling with Desalination plants, Visited USA to work on Membrane based Desalination Systems. Also visited **UAE, Sri Lanka & Nepal** on invitations. He has organized many National and International Conferences in India including **CHEMCONS, SCHEMCONS & INDACONS** on numbers of occasions and published /presented about **110 papers** in Journals & Conferences.

Apart from all these achievements Prof. Srivastava has installed several plants in India like 1 Ton per day Capacity, **Electro Thermal Phosphorus pilot plant**, Trombay; 30 Tons per day Capacity **BWRO Plant** at Sheelgan Village, Barmer Dist. Raj and Nellore Dist. A.P.; 100 Tons per day Capacity **SWRO Plant** at Trombay, Mumbai; **1800 Tons per day Capacity SWRO Plant** at Kalpakkam, TN; 425 Tons per day Capacity **MSF Plant** at Trombay, Mumbai; **4500 Tons per day Capacity MSF Plant** at Kalpakkam, TN; 30 & 50 Tons per day Capacity **LTE Plant** at **CIRUS Reactor**, Trombay; **50 Tons per day Capacity Barge Mounted SWRO Plant** at Trombay and **50 & 240 Tons per day Capacity MED Plant** at Trombay.

In appreciation to his services to InDA for last 25 years and his contributions in the field of Desalination, Indian Desalination Association takes the pride in conferring the **LIFETIME ACHIEVEMENT AWARD** to **Prof. Vinay Kumar Srivastava**.

Jodhpur
March 26, 2022.

Prof. S. P. Chaurasia
President



Become IChE Member

The Indian Institute of Chemical Engineers (IChE) is the apex professional body of chemical engineers in India. It has a membership of about fifteen thousand including Corporate Members and Student Members. There are forty-one Regional Centers and forty-seven Student Chapters of the Institute in different parts of India. The Institute represents the chemical engineering profession in India. Many members of the Institute serve on various technical committees of the Government of India and of chemical and allied industries. Here are some of the benefits that a member of the Institute enjoys.

- Since IChE is the recognized forum, membership of the Institute itself is considered as a professional accomplishment of a person.
- A member can join numerous seminars, symposia, workshops, training programme, special lectures, industry visits and other professional activities.
- A corporate member is eligible to contest in the annual election to the 25-member Council, which is the highest policy-making body of the Institute.
- IChE has an active consultancy programme. An interested member may seek and get help from the Institute in his endeavor to offer consultancy services to potential industrial customers.
- A member can join the four-day Annual Professional Meet called CHEMCON on a subsidized fee. Various professional meets organized by IChE acts as a forum for interaction and networking of the professionals
- The student members may join as member of seminars specifically meant for them and can participate in a number of competitions. One of such popular seminar is SCHEMCON which is organized by one of the IChE Student Chapters.
- A corporate member may be nominated to various government and non-government bodies in different areas, if found suitable.

Details about types of membership, membership fees & subscriptions, membership card etc. are available on IChE website.

<https://www.iiche.org.in/joiniiche.php>

Online Application forms for Life Fellowship, life Membership, life Associate Membership, Student membership, Organisational Membership are also available on IChE website.

IIChE Forthcoming Events at a Glance

CHEMCON 2022

Harcourt Butler Technical University, Kanpur

December 27th to 30th, 2022



**Chemical Engineering Congress &
75th Annual Session of Indian Institute of Chemical Engineers**

**Sustainability in chemical processes
through Digitalization, Artificial Intelligence and Green Chemistry**



Continued ...

CHEMCON 2022

Indian Institute of Chemical Engineers (IChE) was instituted on 18th May, 1947 on the eve of the Indian Independence. Dr. Hira Lal Roy, the great visionary and pioneer of Chemical Engineering Education in India, along with few other senior colleagues felt the need for a platform to spread education of Chemical Engineering in India. On the 75th year of India's Independence, the whole country is celebrating "Azadi ki Amrit Mahotsav" with a humongous goal of "Atma Nirbhar Bharat". Selfreliant and confident India will eventually ensure a sustained movement of Chemical Engineering profession through academic excellence, research, development, and industrial revolution.

Today with around 30,000 members on its roll, Institute has emerged as the apex body of Chemical Engineering Professionals in India. The activities of the Institute are spread across the country through its 42 Regional Centres and more than 168 student chapters. The Regional Centres promote and complement the activities and objectives of the Institute – within their respective territorial limits by organizing seminars, conferences, workshops, refresher courses, counseling sessions, and guiding career planning etc. The institute is recognized by the Department of Science & Technology, Govt of India as a Scientific and Industrial Research Organization and has 150 organizational members.

Both Indian Institute of Chemical Engineering and the Nation celebrate their 75th Anniversary year of Foundation in 2022. Ever since its foundation, the mission of IChE has been to contribute to the Nation building through dissemination of knowledge and enhancement of skill in the field of Chemical Engineering and its allied areas. Inspite of a challenging path, IChE has been always steadfast in its role. Today the Organization has emerged as a premier professional platform for Chemical Engineering Education and Profession in India, having a Pan India outreach. IChE spreads the message and movement of Chemical Engineering by conducting classes and conferences throughout the year at regular interval. However, its annual event which is known as Chemical Engineering Congress (CHEMCON) stands out tall owing to its wide reach across National and International forum. CHEMCON provides an opportunity for all senior students of Chemical Engineering, research scholars, professors, industry experts to come together ensuring four days of intensive interface of knowledge and experience. These exchanges of thoughts and theories help all delegates to constantly update and equip themselves in a fast-changing scenario which calls for research and development in Chemical Engineering applications. CHEMCON 2022 will be 75th Annual Session of IChE and will be organized by Kanpur Regional Centre. After many decades, CHEMCON is coming to Kanpur, the industrial city of Uttar Pradesh State. CHEMCON 2022 will present a host of events, which includes memorial lectures, plenary lectures, seminars, panel discussions, international symposium, industrial exhibitions etc. It's a matter of great honour and privilege for Patrons and Members of NOC and LOC to invite you to participate in the thought-provoking deliberations in this flagship event of IChE.

Continued ...

CHEMCON 2022

Third
Announcement



Chemical Engineering Congress

CHEMCON 2022

&

75TH ANNUAL SESSION (PLATINUM JUBILEE) OF
INDIAN INSTITUTE OF CHEMICAL ENGINEERS

December 27th to 30th 2022

Harcourt Butler Technical University, Kanpur, India

Sustainability in Chemical Processes through Digitalization,
Artificial Intelligence and Green Chemistry

::: Principal Organiser :::
Kanpur Regional Centre
IICHE

::: ::: Conference Partners ::: ::: :::

Indian Institute of Technology (IIT), Kanpur
Harcourt Butler Technical University (HBTU), Kanpur
University Institute of Engineering and
Technology (UIET), CSJMU, Kanpur
Dr. Ambedkar Institute of Technology for
Handicapped (AITH), Kanpur

::: ::: In Association with ::: ::: :::

Rajiv Gandhi Institute of Petroleum Technology, Amethi
Dr. A.P.J. Abdul Kalam Technical University (AKTU), Lucknow

::: ::: Joint Symposium Collaboration with ::: ::: :::

Society of Chemical Engineers, Japan (SCEJ)
European Federation of Chemical Engineering (EFCE)
Canadian Society for Chemical Engineering (CSCHE)
American Institute of Chemical Engineers (AIChE)*
*confirmation awaited

Continued ...

CHEMCON -2022 IMPORTANT DATES

Last Date of Abstract Submission	31st August 2022
Intimation of Acceptance of Abstract	1st July – 15th September 2022
Full Paper Submission	1st August – 31st October 2022
Last Date of Full Paper Submission	31st October 2022
Registration (Early Bird)*	Upto 15th September 2022
Registration (Normal)	16th September – 30th November 2022
Registration Closing	1st December 2022
Registration (Spot)**	At CHEMCON 2022 Venue

The Seventy-fifth i.e. Platinum Jubilee Year of Annual Session of Indian Institute of Chemical Engineers (IIChE) will be organized by Kanpur Regional Centre of IIChE from 27th to 30th December, 2022 in partnership with Indian Institute of Technology, Kanpur, Harcourt Butler Technical University and University Institute of Engineering and Technology, CSJM University and Dr. Ambedkar Institute of Technology for Handicapped, Kanpur. CHEMCONs have been considered as the ultimate technical jamboree for all senior students, practicing professionals, research scholars as well as academicians in the area of Chemical Engineering. Brilliant minds and engineering talents from all over the country assemble in CHEMCON arena to listen to lectures of Nobel Laureates, Renowned Professors, Research Scholars, and Industry Experts. The eternal goal of CHEMCON has been to evolve a technology driven society which shall lay emphasis on development in the field of Chemical Engineering. Advancement in new technologies will enable Chemical Engineers and Research Scholars to work together in building a more sustainable industry in future. Chemical Engineering is a very vast field, and it touches every aspect of human lives with irreversible contribution. In CHEMCON 2022, an attempt is being made to bring together best scholars, academicians, practicing professionals, industry experts, engineering consultants, industry chambers to deliberate and exchange their views on futuristic advancement in the field of Chemical Engineering.

For all the queries,

Kindly contact through official email or website www.chemcon2022

Dr. Umesh Chandra Sharma

Organizing Secretary and Convenor, NOC (CHEMCON 2022)

Asst. Professor, Dept. of Chemical Engineering

University Institute of Engineering and Technology

CSJM University, Kanpur

(M) +91 9454628234, Email : uc_sharma@hotmail.com,

chemcon2022.organizing.secretary@gmail.com

IChE Forthcoming Events at a Glance

SCHEMCON 2022

Students' Chemical Engineering Congress (SCHEMCON), is an annual event organized by the Institutes having Students' Chapter of Indian Institute of Chemical Engineers (IChE) under one of its Regional Centers. Chemical engineers interested in innovation and professional growth will meet with academic and industry experts to cover wide range of topics relevant to cutting-edge research, new technologies, and emerging growth areas in chemical engineering. It provides a platform for the Chemical Engineering Students to interact, learn and gain exposure to the expanding arena of Chemical Engineering.

(IChE)
Celebrating 75 years of glorious journey...

SCHEMCON 2022



**(18th Annual Session of Chemical Engineering
Students Congress)**

At NIT Warangal, 23rd -24th September 2022



**On theme "Sustainable Technological
Advancements In Chemical Industries -2022
(STAC-2022)"**

**Organized by
Department of Chemical Engineering
National Institute of Technology Warangal, TS.
&
IChE- Hyderabad Regional Centre
Under the aegis of
IChE Student Chapter of NITW**

Continued ...



Indian Institute of Chemical Engineers (IICChE)
Celebrating 75 years of glorious journey...

National Institute of Technology Warangal
& IICChE HRC



SCHEMCON 2022

**Abstract
Submission
deadline is
Extended till
05th Aug'22**

18th Annual Session of Chemical Engineering Students Congress

Sustainable Technological Advancements In Chemical Industries -2022 (STAC-2022)

Register Today to win:



Venue:
NIT Warangal



**CASH
PRIZES**

**23rd & 24th
Sept 2022**

**SAVE THE
DATE**

<http://cms.nitw.ac.in/schemcon/>



- ✓ Keynote Lecture
- ✓ Invited Lectures
- ✓ Oral Presentations
- ✓ Poster presentations
- ✓ M.P. Chary Memorial Award
- Quiz
- Fun Events
- Cultural Night

Important Dates



Submission of the Abstract	05 th August 22
Acceptance Notification & Registration Fee	25 th August 22
Last date of Registration	5 th September 22
Conference Dates	23 rd & 24 th Sep'22



For more information: Organizing secretary, SCHEMCON-2022 (+91 999 46 466 10)

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75
Azadi Ka
Amrit Mahotsav

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