

## Centre of Excellence in Process Safety and Risk Management for a Hydrogen Economy (CoE in PS & RM – H<sup>2</sup>) Indian Institute of Technology, Delhi (IITD).



A unique Centre of Excellence in Process Safety & Risk Management for a Hydrogen Economy has been established in IITD, under a MoU between IITD (the Academic partner), Nayara (industry partner) and Gexcon (knowledge partner) to develop human capital and to carry out training, research, consultancy and advisory in domain areas of Process Safety, Risk management, Hydrogen Safety and Green Hydrogen, as also providing consultancy and advisory to industries, Govt. and Public Sector units of Govt.

This was the outcome of a series of meetings and discussions with Govt Ministries like MoEF, premium academic institutes like IIT Delhi, IIT Mumbai, IIT Dehradun, ICT Mumbai, and research Institutes like CSIR NEERI Nagpur, ONGC Safety Institute Goa, and leading process industries. Process industries in various sectors- Chemicals, petrochemicals, and energy like Oil & Natural Gas Corporation Limited recognize Process Safety & Risk Management as an area with an enormous potential.

There was unanimous agreement on the strong need for such a CoE in India. Further, all the participants exhibited keen interest to join hands to set up the CoE.

Accidents /disasters result in unacceptable loss of lives, injuries to people, loss of property, and damage to the environment. Moreover, they result in loss of reputation within the industry and loss of confidence among the public. They consume resources which otherwise can be deployed for development. Accidents over the past few decades, both within and outside the country, have raised awareness of the key risk control systems needed to prevent such accidents and have led to tighter regulations.

## Brief Description on the idea of project:



***Left to Right; Prof. Chitra Rajagopal (Director, CoE), Dr. J. P. Gupta (Chairman, CoE), Miss. Jale Cairney (CEO-Consulting, Gexcon), Mr. Paul Taylor (CEO – Software, Gexcon)***

Emerging economies like India need to enhance their institutions and their infrastructure significantly and focus on prevention of accidents if they are to realise their long-term growth potential. Currently, there is no centralized system in India to document and investigate all chemical accidents. Globally it is proven that the learning from previous accidents helps in prevention of accidents and in designing safer plants and effective mitigation systems. Government, industry, and educational institutes work together on learning and prevention of accidents. Several Universities /research organizations have taken the initiative to develop advanced education and research in prevention of accidents.

Long term goal is replacing fossil fuels as an energy source with green power is becoming one of the most effective tools to combat climate change. Hydrogen is at the forefront of India's renewable energy roadmap to meet the country's commitments in COP26. Technological challenges related to all aspects of the Hydrogen economy (Production, Storage, Transportation and Utilization) need to be addressed. Most importantly, safety issues must be addressed for successful hydrogen technology acceptance and its deployment. A significant accident involving a hydrogen project could negatively impact the public's perception of hydrogen systems as viable, safe, and clean alternatives to conventional energy systems. However, insufficient knowledge about critical safety aspects related to the widespread roll-out of hydrogen technology represents a bottleneck for industry, authorities, end-users, and the public.

India already has a vast network of National Research Laboratories and premium academic institutions like IITs, NIT, and Universities which cover a wide spectrum of science and technology in the related to the Hydrogen ecosystem. However, India do not have any centralized centre or organisation which focuses on Hydrogen Safety and its future challenges. The commercial safe use of hydrogen needs co-ordination among the ministries and its regulatory bodies. To address the hydrogen technologies and its safety challenges we saw a need for the setting up of a Centre of Excellence (CoE) in Hydrogen by energy companies in India.

Under the guidance of several eminent scientists, professors, and subject matter experts, it was proposed to establish a Centre of Excellence (CoE) focusing on Process Safety and Risk Management for a Hydrogen Economy (CoE in PS & RM – H2).

The purpose of this CoE is to enhance safety consciousness in the country and build capacity across all stakeholders in Industry, Govt., academia, and research Institutions, to ensure a better understanding of the concepts and practice of accident prevention and mitigation, as also, to enhance competence in and provide inputs for the development of safety standards and regulations. Eventually, CoE, PS & RM – H2 will encourage innovation and R&D to develop indigenous solutions to build safer plants, develop better operating & maintenance practices and reduce overall risk to people, assets, and the environment.

It is the first of its kind in India, involved in training, higher education, research, developing innovative solutions and consultancy work. Selected candidates will also have the opportunity to enroll for Masters/ Ph. D from Global Universities under students exchange program

CoE PS & RM – H2 is looking forward to expanding its support to industries like chemical process industries, petrochemicals, energy (renewable, oil & gas, Hydrogen, LNG), pharma, food & beverages, transportation, mechanical equipment for safety assessment and risk management.

Presently, CoE PS & RM – H2 is equipped with the advanced computational facility and softwares offering a wide variety of analytical solutions to help understand and manage your challenges. These include tools in consequence modelling, quantitative risk analysis (QRA) and pre-incident planning.

With advances facility and process safety consultants, industry experts, and scientists will provide services to assist at all stages of your engineering and management control process, from concept design, process development, facility safe operation, initial hazard evaluation to continued safe operability of your facility.

CoE is also focused on to provide dedicated degree programs in the field of process safety and risk management and promote further R&D activities to meet the goal of Zero-Carbon emission 2050.

## CoE Activity and Training Programs:



***Visit of Gexcon Executive Leaders and CoE Governing Council at Shriram Institute, New Delhi.***



***Visit and Meeting of Gexcon Executive Leaders and CoE Governing Council on CoE Road Map at IITD CoE New Delhi.***



***One Day training program on Process Safety Management and Risk Management for Various Indian Government Research lab (DRDO, HEMRL, ARDE, NCL, ACEM), Conducted by Gexcon and CoE Experts at DRDO, Pune, India.***



***One Day training program on Process Safety Management and Risk Management for Insurance and Risk Management Industries, Conducted by Gexcon and CoE Experts at at National Insurance Academy (NIA), Pune.***