

Department of Chemical Engineering, IIT Hyderabad
CH5036-Industry Lecture Series
Jan-May 2025



Date: 16-04-2025

Time: 04:00 PM (IST)

Speaker: Kaushik Basak

Affiliation: Shell

Title: **Process Safety & Scale-Up Challenges: An Industry Perspective**

Venue: LHC-01

Abstract

The topic of process safety has multiple aspects - the presentation would provide an overview of the safety concerns while scaling up from the lab-scale operations through the pilot plant to the production operations. Each section will cover safety challenges and important issues along with some recommendations and best practices at each scale of operation. Process safety incidents often occur because several concurrent failures happen at the same time, which will be explained referring to the Swiss Cheese model, which depicts how weaknesses can align to lead to an incident. Another key aspect in chemical engineering which has huge industrial impact is scale-up of the processes. The goal of scale-up is to identify and develop a process that will successfully produce a desired product when manufactured at a commercial scale. To successfully move from the small scale to the large, one must understand how size changes impact several physical and chemical phenomena, and, how to interpret the same. The presentation would cover the challenges for process safety and process scale up and provide pertinent examples from the industry to demonstrate the principles.

Biography

Kaushik Basak, who is a holder of master's degree in chemical engineering from IIT Kanpur, is a part of the energy industry for more than 26 years having deep expertise in both refining and petrochemicals. He has worked at multiple global technology centres and manufacturing sites in India, Singapore, and The Netherlands and is currently the Global Technology Manager of Hydrocracking in Shell. He is

accountable for the delivery of hydrocracking technology, licensing and R&D by his team co-located in Bangalore, Amsterdam & Houston. He also has the additional responsibility of building the R&D process development talent funnel and thriving community in Asia-Pacific as the Regional Discipline Lead. Kaushik has led diverse R&D activities from discovery to deployment stages, managed process engineering projects, led licensing proposals and provided technical support in the areas of process safety, scale-up, optimisation and troubleshooting to the manufacturing sites. He has developed several commercially successful processes and catalysts and is involved in collaboration activities with the academia and likes to mentor young professionals. He is a Fellow of IChemE (UK), senior member of AIChE and life member of IChE. He holds 15 patents, co-authored chapters in 3 books and published 10 papers in referred journals as well as presented at many international and national seminars and conferences.