

OFFSHORE PROCESS TECHNOLOGY

By: Dr. U. K. Dutta

Who should attend:

1	Engineers, R&D personnel and managers from upstream oil and gas industry.
2	Project Managers and multi-discipline engineering personnel from EPC companies.
3	Graduate Trainees of a company doing business in the area of oil, gas, refinery and petrochemical industry.



About the Course

The offshore production of hydrocarbon resources has moved a long way from the first steel structure platforms at shallow water (10-20 meters) in the sixties to sub-sea production systems and FPSO operating at a depth of 2000 meters. This has also created a substantial rise on cost of production from a few Dollars per barrel to around 20 Dollars per barrel.

An offshore structure or FPSO is created to house the process system, which occupies bulk of the space. For cost effective design of such a facility, a close understanding of the process system and the technology by the entire engineering, project management and production team is needed. Also there is need for R&D effort.

The course is aimed at creating an understanding of the process technology and process systems by the entire project, engineering and operation team. It starts from evolving the design basis for process facilities, sizing and selection of hardware which occupy the space, technology trends in hardware and process system area and future trends in process technology area. It also helps to update the participants on trends on process technologies, where R&D effort is needed.

Course Content:

No	TOPIC	DESCRIPTION
1	Basic Concepts, Definitions and Terminologies	<ul style="list-style-type: none"> ● Origin and characteristics of hydrocarbon reserves. ● Industry Terminologies ● Definition process streams. ● Well fluid characteristics. ● Crude oil characteristics. ● Composition and types of natural gas. ● Field life and production profile. ● Design basis for process system.
2	Introduction to Oilfield Processing Schemes	<ul style="list-style-type: none"> ● Why processing at the oilfield? ● Primary, secondary and tertiary recovery. ● Processing schemes for primary recovery - <ul style="list-style-type: none"> ○ Separation systems ○ Dehydration of oil and gas ○ Sweetening of gas ○ Gas compression ○ Water treatment and disposal ○ Utility systems ● Secondary and tertiary recovery schemes- <ul style="list-style-type: none"> ○ Gas lift and gas injection schemes. ○ Water injection scheme. ○ Other recovery processes. ● Key issues in process concept development. ● The gathering system. ● Two phase flow dynamics. ● Process flow diagram – definition and development. ● Fixed platform and floating production facilities (FPSO). ● Offshore field configuration

3	Process Selection and Technology Equipment	<ul style="list-style-type: none"> • Separator types • Separator sizing and selection. • Separation technology developments. • Desanding. • Emulsion treatment and oil dehydration. • Oil dehydration technology. • Salient features in gas dehydration system. • Gas sweetening technology. • Gas sweetening process selection. • Produced water treatment.
4	Process Aspects Engineering	<ul style="list-style-type: none"> • Need for multi-disciplinary approach. • Codes and standards. • Safety systems. • API RP 14 C application. • Revamp and up-gradation of facilities. • Development of P&IDs.
5	Technology trends	<ul style="list-style-type: none"> • Separation. • Two phase pumping. • Membrane separation. • Natural gas liquefaction offshore- <ul style="list-style-type: none"> ○ LNG ○ GTL or Syn-fuel ○ Gas to Methanol • Floating liquefaction plants. • Deep sea technology vis-à-vis process engineering.

Methodology of presentation:

- Microsoft Power Point colorful slides packed with information.
- Highly interactive with total involvement of the participants.
- Interesting and Interactive Quiz Sessions, group tasks for better assimilation.

Course Materials:

- One Hard copy of presentation slides with reading material.

Course Instructor:

Lead Faculty: Dr. U.K.Dutta

Dr. U.K. Dutta is a process consultant in the Hydrocarbon Process Industry, focusing on Consultancy and Training. Doctorate from Loughborough University of Technology (U.K), he has over 30 years of experience in Hydrocarbon Industry (upstream and downstream) in the areas of **process and technology, engineering consultancy, project development, marketing and organizational development**. He has been involved in the development for major oil and gas fields and process design of major offshore production facilities. He had work experience and association with major Indian and International companies like EIL, Union Carbide, CE Natco, Lummus Crest, Triune and Rotary Engineering. He has presented papers on Technology Development and Technology Transfer in major International Conferences such as ASCOPE and CHEMTECH. Presently he is running his own consultancy firm, 'Technomanage Consultants' with base at New Delhi. **He has conducted training for executives for major companies like Petronas (Malaysia), Petrosin (Singapore), The Yokogawa Group, Technip (India), Triune Projects (India), PTT (Thailand), Aker-Kvaerner (Philippines), Indian Chamber of Commerce, Ernst & Young and others. He regularly conducts open programs for executives in Singapore jointly with National University of Singapore, and international seminars in Malaysia and Thailand.**

Depending on availability, other leading experts from the industry may be called to present their experience on the subject.