



*Carmagen Course No. 1245*

## CRUDE TANK MIXING AND SLUDGE CONTROL

### Objective

Develop an understanding of mixing concepts pertaining to suspension of sludge and blending of miscible liquids. Develop familiarity with design guidelines for selecting and sizing mixing systems. Provide tools for troubleshooting and retrofitting existing mixing equipment to improve tank operations.

### Who Should Attend

Technical staff and supervisors involved in designing and operating mixing systems for crude storage tanks and product blending tanks. The participants will develop an understanding of fundamental mixing concepts relating to these refinery operations.

### Description

Mixing systems for crude storage and product blending tanks must be adequately designed and operated for suspension of sludge and homogenization of refinery products. Two types of mixers are commonly used: side entering propeller (SEP) mixers and submerged jets. Both mixers create flow patterns necessary for the two processes carried out in tank sizes as large as 400 kbbbl. Inadequate mixing in crude storage tanks can cause excessive sludge accumulation resulting in capacity loss and damage to downstream equipment such as desalters and pipestill.

The course is given through presentations with example problems commonly encountered in the petroleum industry along with design and scale-up tools. Discussions on specific mixing applications and problems will be encouraged.

Fundamental mixing concepts applicable to side entering propeller mixers and submerged jet nozzle systems. Design and scale-up of the two mixing systems for onstream and offstream sludge control in crude storage tanks and blending in large tanks. Discussions will include evaluation of existing mixing systems and selecting and designing suitable mixing systems based on tank sizes and process conditions.

The following topics will be covered:

- Fundamental mixing concepts
- Sludge control in crude oil storage tanks
  - Onstream mixing - SEPs, submerged rotating jets
  - Offstream sludge handling - mechanical, heat transfer, chemical
  - Sludge monitoring and sampling
- Product blending tanks - SEPs, submerged jets

### Course Duration

2 days

*All the right people in all the right places.*

