CRUDE CONDITIONING AND STORAGE

- Hydrocarbon gases and light and heavy hydrocarbon liquids are all present in a single homogeneous phase under pressure in the formation before it is drilled.
- Raw crude oil collected from the wells also contains sand, mud, and water as impurities which may vary from 20% to 30% by volume.
- Treatment steps:
  - Gravity settling
  - Removal of sand and water
  - Chemical Treatment to remove emulsified water
  - Crude conditioning unit

Why and How can we increase the dissolution of gases during crude conditioning and storage?

- Gases lighter than propane tend to escape, whereas propane and heavier gases are found dissolved in crude oil at atmospheric pressure.
- Proper mixing and repeated heating above room temperature (usually 45°C–50°C at low pressure and up to 90°C at a pressure of 2–3 atm) followed by cooling to storage temperature can increase the dissolution of gases and homogenize the layers of light and heavy liquid hydrocarbons.

How can we prevent segregated wax from chocking the pipeline and pumping equipment?

- Segregated wax in crude oil may choke the pipeline and pumping equipment due to deposition.
- Heating of crude with a mixing facility reduces segregation of wax by making it uniformly distributed in the bulk and thus it can be stored and transported without risk of deposition for many hours at room temperature or lower temperature above the pour point
- Heating can be provided by a steam coil in the storage vessel with mechanical mixers, and cooling is done in another vessel with cooling coils in which refrigerants may be the vaporizing hydrocarbon gas or other liquids

TRANSPORTATION AND METERING OF CRUDE OIL

Lecture 6

How crude oil is transported?

- Treated crude oil is received in large storage tanks usually under pressure to avoid loss of hydrocarbon vapors and is dispatched by tankers (ships), trailers (large tank cars), and most conveniently through pipelines. Pipelines as long as 1000 m or more from the oil field tanks to the refineries or to the shipping ports are most common in any oil-producing country.

How can we maintain the delivery pressure to the receiving ends?

Booster pumping stations are placed at the required positions to maintain delivery pressure to the receiving ends. High pressure centrifugal or screw pumps are employed for pumping through pipelines.

The horse power of such pumps may vary from 500 to 2,000 hp with a capacity to transport 500–1,000 m^3/h with a discharge pressure of 100 atm or more.