

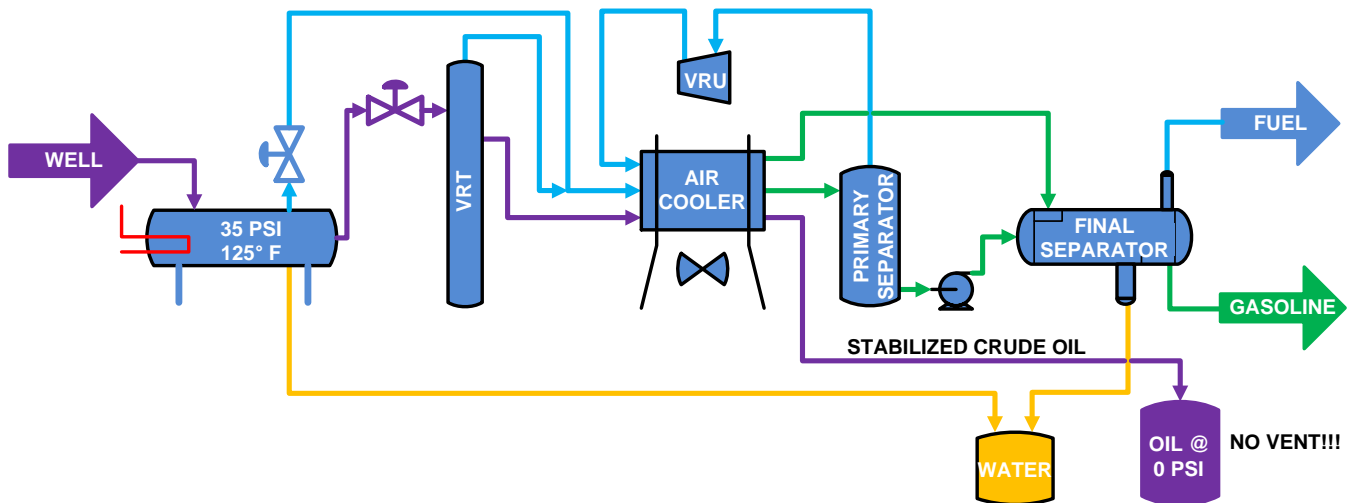
CRUDE OIL STABILIZATION AND RECOVERY

Crude Oil Stabilization, Tank Vent Elimination, Vent Gas Monetization and EPA Quad O Compliance

Aspen Engineering Services offers a revolutionary, cost-effective solution to the EPA’s Quad O regulation. The Crude Oil Stabilization and Recovery (COSR) process captures the value of the natural gasoline from the vent gas and completely eliminates the tank vent. Concurrently, the volatility of the oil is stabilized for safer storage and shipment. The patent-pending COSR process is a unique solution for the oil and gas industry.

Crude oil is heated to 130° F in the heater treater at 30-50 psig to vaporize and separate volatile organic compounds from hot oil and water. Alternatively, the pressure in the heater treater can be reduced without raising the temperature. The oil from the heater treater is delivered to a Vapor Recovery Tower (VRT) where Volatile Organic Compounds are separated. The oil is cooled in an air cooler, and then flows into the storage tank. The oil does not flash in the storage tank because the Volatile Organic Compounds have been removed and the oil is cooled.

The VRT gas flows through a partitioned air cooler to condense water and heavy hydrocarbons. The condensed liquids are separated in a scrubber and pumped to a separator. The scrubber vent is pressurized in a Vapor Recovery Unit (VRU). The pressurized gas from the VRU is condensed in the partitioned air cooler. The condensed liquids from the VRU are separated and stabilized in a separator.



CASE STUDY

Six crude oil wells, each producing 425 barrels per day, with an uncontrolled Reid vapor pressure of 24, are gathered to feed a single heater treater at 50 psig. The Reid vapor pressure is reduced to 9.0 psi. Concurrently, the tank vent is completely recovered without a flare.

| | COSR | Uncontrolled |
|-------------------------------------|------------|--------------|
| Vent recovery | 100% | 0% |
| Crude oil Reid vapor pressure, psia | 9.0 | 26.0 |
| Recovered vent value, \$/month | \$ 214,000 | \$0 |