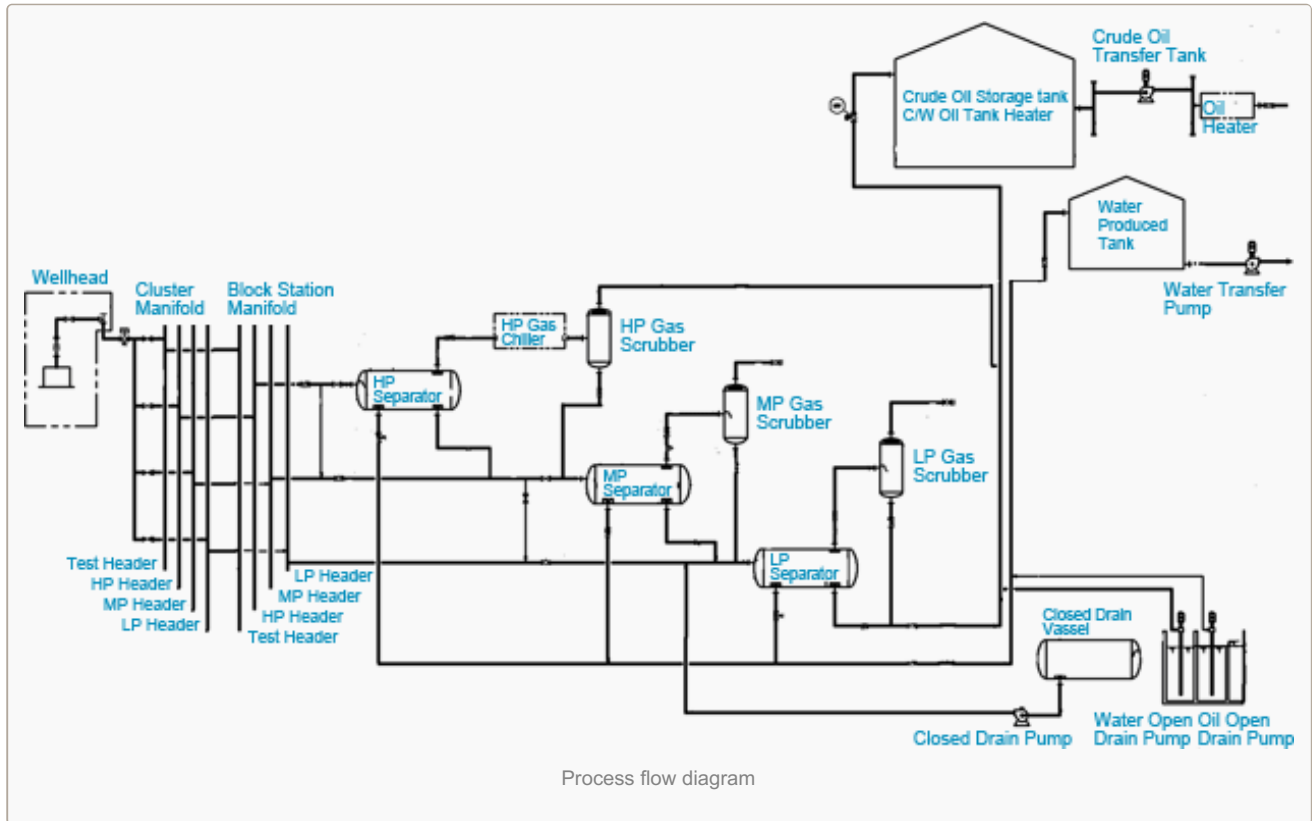


Process Design Basics for Station Facility

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Purpose

The purpose of this article is to establish the design basis [electrical system](#) Front End Engineering Design (FEED) and data design or standards uses in the gathering stations facility will be built. Electrical system design refers to the process flow diagram and utility flow diagrams, existing data of flow diagram contain of equipments that's requires electrical energy (in Horse Power. Hence can be determine electrical equipment sizing, calculation, [single line diagram](#), specification, datasheet.

Other data required is equipment layout plan, hence can be design, such as [cable](#) tray layout, lighting layout plan, typical installation detail and material take off.

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2. Process Description

2.1. Cluster Manifold

The process happen here, fluid derived from the wells will be transferred to Cluster Manifold, each cluster installed a set of Manifold designed to be able to accommodate the production wells with different operating pressures: high pressure, medium pressure and low pressure.

If the well is producing at a high pressure then fluid will flow into High Pressure Manifold Header. If the well pressure drop to medium pressure or low pressure, the fluid will flow into the Medium Pressure or Low Pressure Manifold Header. Test Header also provided for the purpose of well test.

2.2. Block Station

Block Manifold Station consists of Block Station HP Header, Block Station MP Header, Block Station LP Header and Block Station Test Header. Block Station Header designed to accommodate production from all wells in the cluster.

2.3 Unit Separator

Separator dan scrubber functioned to separate water and gas. A Scrubber is part of separator to optimize the separation of the gas separator.

Separator consists of:

1. **High Pressure separator**, the fluids coming from Block Station High Pressure Header is separated in High Pressure Separator. HP gas chilled in High Pressure Gas Chiller then stored in gas storage tank.
2. **Medium Pressure Separator** accommodate both medium pressure oils produced from high pressure separator and fluids from Block Station Medium Pressure Header Manifold. Gas and water contained in Oil and fluids will be separated in Medium Pressure Separator. Medium pressure gas produces will be delivered to Medium Pressure Gas Scrubber in order to minimize carry-over liquid of gas.
3. **Low Pressure Separator**, fluids from both Medium Pressure Separator and Block Station Low Pressure Header Manifold will be separated in Low Pressure Separator. The low pressure gas produced delivered to Fuel Gas Package to meet electricity needs of block station.

For the fluids that comes from Block station Test Header have the same process as the process in pont 1 to point 3 mention above.

2.4. Crude Oil Transfer Pump

Serves to pump the oil production from Crude Oil Storage Tank continuously (24 hours) to final storage tank. There are 2 (two) pump provided that can be run alternately or run t the same time.

2.6. Unit Heater

Oil will be delivered to final storage tank first heated to prevent freezing because the decrease in temperature of oil in pipelines. Unit heater equipped with control system so that can be on/off automatically base on desired set point.

2.7. Pour Point Depressant Injection Unit

Pour point depressant will be injected in order to decrease pour point value of oil so that the oil blockage due to ambient temperature can be suppressed.

2.8. Produced Water Storage Tank

Serves as temporary storage of water produces in production separator. Water storage tanks operated in loading and unloading alternately.

2.9. Water Transfer Pump

Serves to pump the water from water temporary storage tanks to final storage tanks. Consist of 2 (two) unit pumps that can be run alternately or run t the same time.

2.10. Drain System

Closed dan Open Drain System provided for all vessels and tanks in block station. 2 (two) unit Closed Drain Pump designed to pumped liquid from vessel to LP separator.

All drain water will be transfer to waste water basin which is equipped with 2 (two) Oil Open Drain Pump to pump oil to crude oil storage tank, while Water Open Drain Pump purpose is to pumped water from Water Compartment. Water from Open Drain System will pumped to Produced Water Storage Tank.

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3. Utility Unit

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3.1. Fuel Gas System

Unit Fuel Gas System consist of Fuel Gas Scrubber, Fuel Gas Filter and Fuel Gas Heater. Fuel Gas System will supplied fuel needs for Gas Generator, system blanketing dan pilot burner (flare).

3.2. Electrical Power System

To support the operation of block station for electrical power supplied by 2 (two) unit gas turbine generator. In normal condition electrical popwer supplied from gas turbine generator.

Diesel generator designed to supplied electrical power which is essential such as fire alarm system, DCS, power start up GTG, etc. Emergency diesel generator will be run automatically when gas turbine generator fails.

3.3. Instrument / Utility Air System

Instrument / utility air system designed to fulfills instrument air required in plant. Air supply consist of 2 (two) air compressor package, Utility Air Receiver and 2 (two) unit Instrument Air Dryer Package.

2 (two) unit air compressor with electrical motor mover will operate parallel (lead/lag mode).

3.4. Raw Water System

Raw water requires for potable water, service water and fire water. Raw water pump will provided to pumped raw water to service water tank. From service water tank, water delivered to potable water system and service water system.

3.5. Fire Water System

Fire Water System consist of Fire Water Pond, Fire Water Pump, Jockey Pump, Fire Water Main Ring dan other distribution systemsuch as deluge system, spray nozzle, fire monitor, hydrant dan hose reel.

3.6. Service Potable Water

Clean water obtained from potable water package is stored in Potable Water Tank and distributed by Potable Water Distribution Pump.

CONCLUSION

Process flow diagram is basic tool to prepare electrical system design and off course other engineering discipline. All equipment mentioned above is the basic element to prepare electrical design. Anyway different plant has different system and equipment required.

Source:

<http://electrical-engineering-portal.com/process-design-basics-for-station-facility>