

8.17. Sketch a control scheme for the cryogenic stripper shown below that is used for removing small amounts of propane from natural gas.

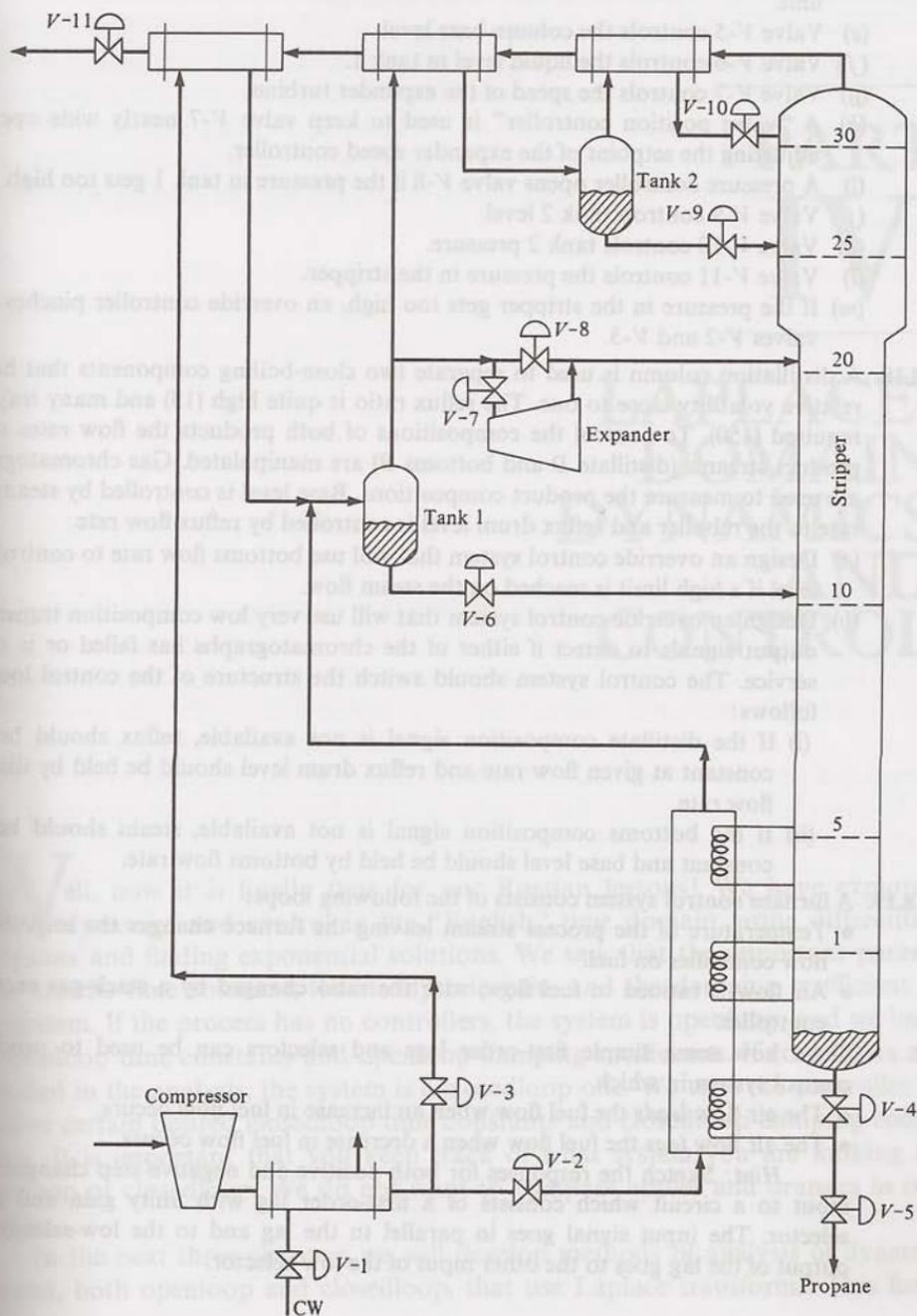


FIGURE P8.17

- (a) Cooling-water valve $V-1$ is manipulated to control the gas temperature leaving the cooler.
- (b) Valve $V-2$ controls a temperature on tray 15 in the stripper.
- (c) Valve $V-3$ controls the total flow rate of gas into the compressor.
- (d) Valve $V-4$ controls the temperature of the propane bottoms product leaving the unit.
- (e) Valve $V-5$ controls the column base level.
- (f) Valve $V-6$ controls the liquid level in tank 1.
- (g) Valve $V-7$ controls the speed of the expander turbine.
- (h) A “valve position controller” is used to keep valve $V-7$ nearly wide open by adjusting the setpoint of the expander speed controller.
- (i) A pressure controller opens valve $V-8$ if the pressure in tank 1 gets too high.
- (j) Valve $V-9$ controls tank 2 level.
- (k) Valve $V-10$ controls tank 2 pressure.
- (l) Valve $V-11$ controls the pressure in the stripper.
- (m) If the pressure in the stripper gets too high, an override controller pinches both valves $V-2$ and $V-3$.