Questions?

Recall: Regen Rankine w/ OFWH

> Split fraction of feed steam turbine to preheat boiler feedwater

> To find fraction, analyze FWHT closest to boiler first

> Use energy balance on FWHT to find fraction.

Closed FWHT - Steam from turbine condenses over tubes containing feedwater. The two fluids do not mix. The pressures typically are not the same.

See Fig. 10-16.
Write First Law for C-V on CFW

\[ y h_2 + (1-y) h_2 = y h_3 + (1-y) h_9 \]

If all states are known, then \( y \) can be found

\[ y(\Delta h_7 + \Delta h_9 - \Delta h_2) = h_9 - h_2 \]

\[ y = \frac{h_9 - h_2}{(\Delta h_7 + \Delta h_9)} \]

State(7): From turbine analysis (either isentropic or \( \eta_{13} \))

State(3): By design, SAT LIQ at \( P_3 \)

State(2): From pump analysis (either isentropic or \( \eta_{13} \))

State(9): ??

Heat exchanger \( T_4 \)

With no better way, we must assume

\[ T_9 = T_{ideal} = T_{sat} |_{P_3} \]

\[ h_9 = \text{comp. liq.} \]

State 9: \( (P_9, T_9) \)

\[ h_9 = h_e(T_9) + \psi_e(T_9) \times (P_9 - P_{sat} |_{T_9}) \]