

Show Your Work

1

Direct water injection steam cooling

Superheated steam:
215PSI @ 455F
Q = 5000-17000PPH

Desired steam temp: Saturated + 10F

Boiler Feedwater:
550PSI @ 281F

What is the range of water flows required to cool the steam?

2

Direct steam injection heating

Plant water supply
53PSI @68F
Q=758GPM

Plant water temp required: 110F

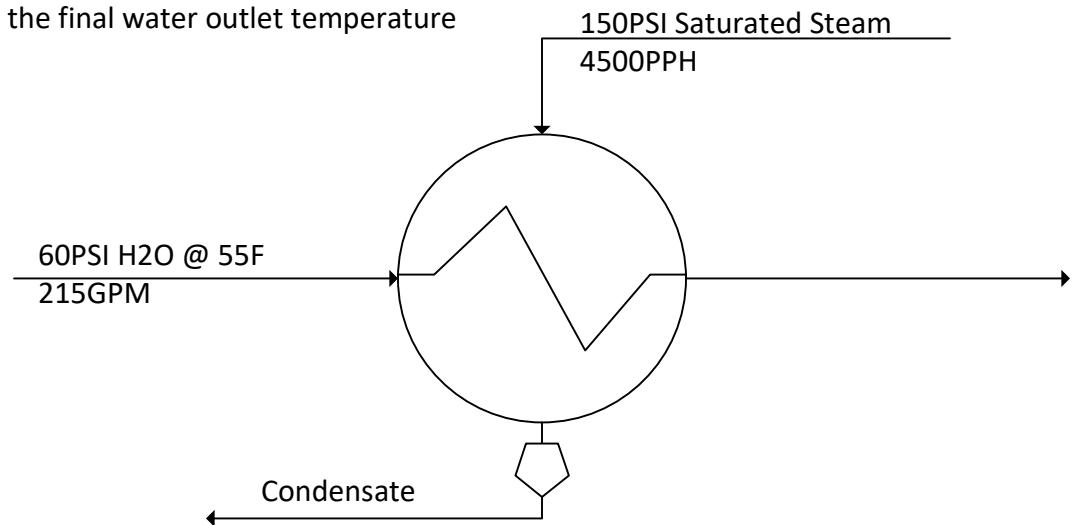
Steam supply
150PSI @370F

What is the steam flow (PPH) required to heat the water?



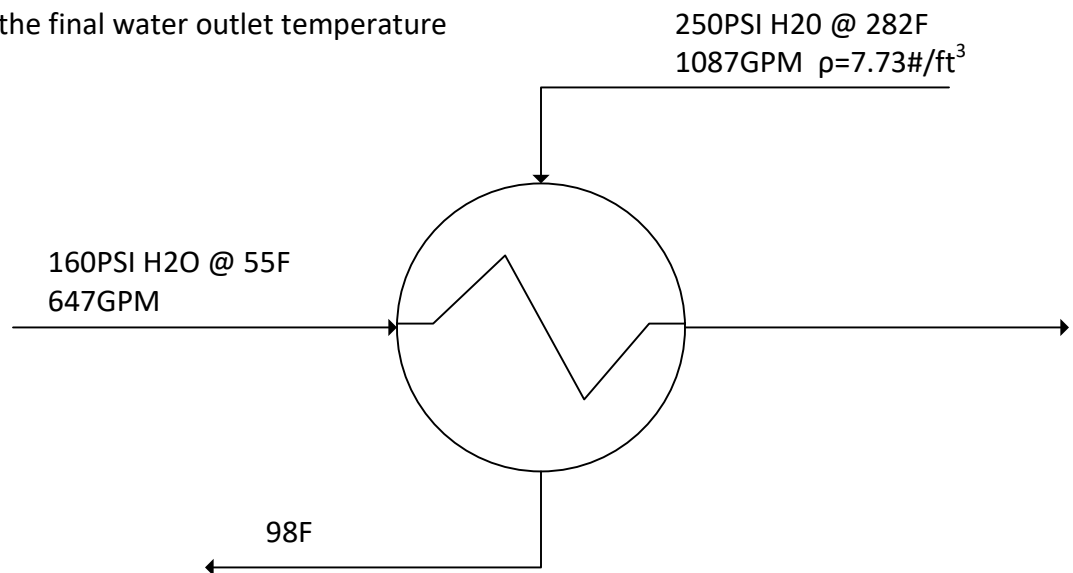
3

Calculate the final water outlet temperature



4

Calculate the final water outlet temperature



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Part A: Calculate the heat transfer and exchanger efficiency for each heat exchanger:
 Part B: Calculate the total heat rejection for the cooling tower:

