

GE Power & Water

Water & Process Treatment

Potash Evaporator and Crystallizer

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Today's Agenda

- Technology Overview
- Project-Balance



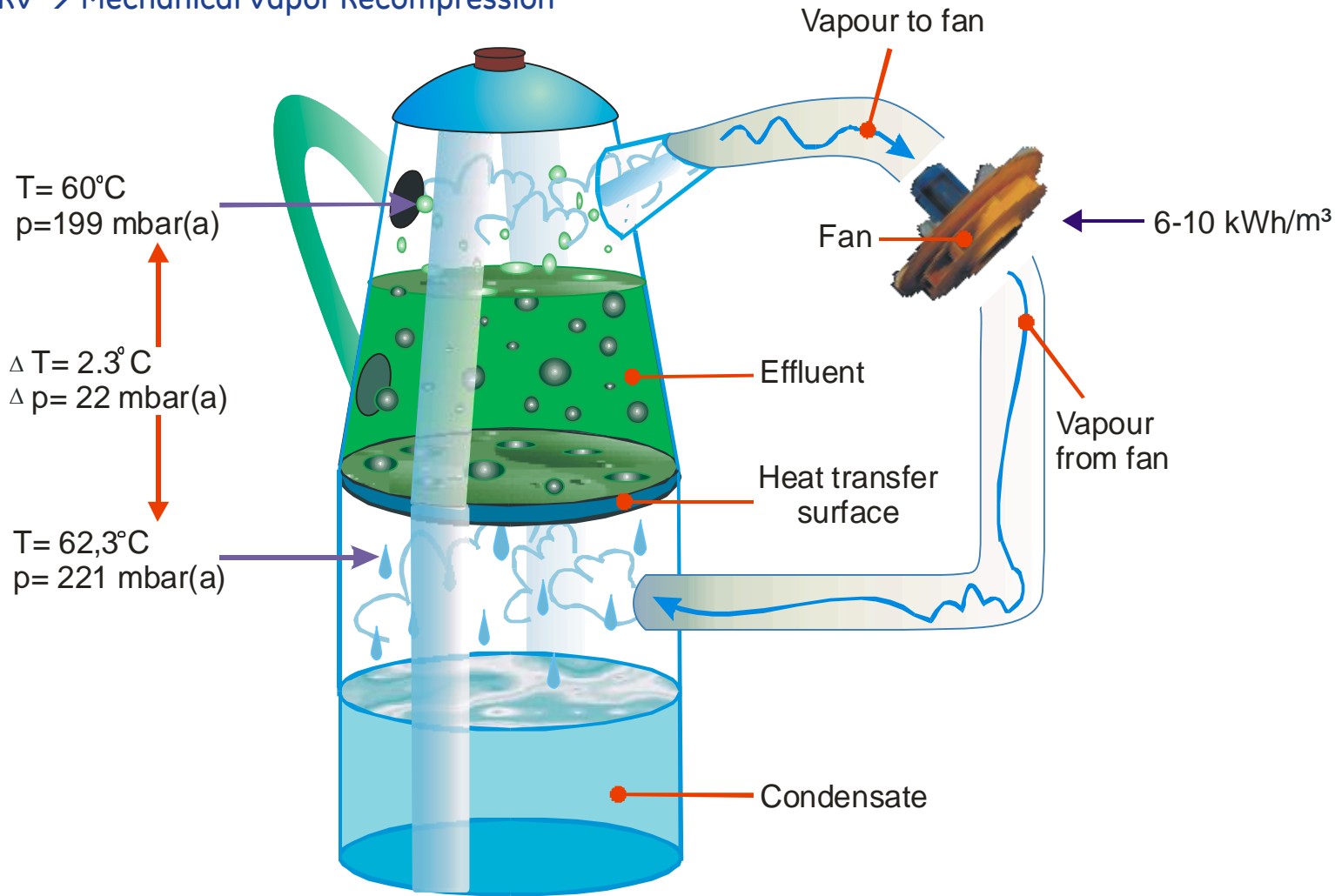
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Two ways of evaporation

- Steam / Waste heat
Preferred when there is excess on heat or steam at the site
- Mechanical Vapor Recompression (MRV)
Used if electricity is preferred

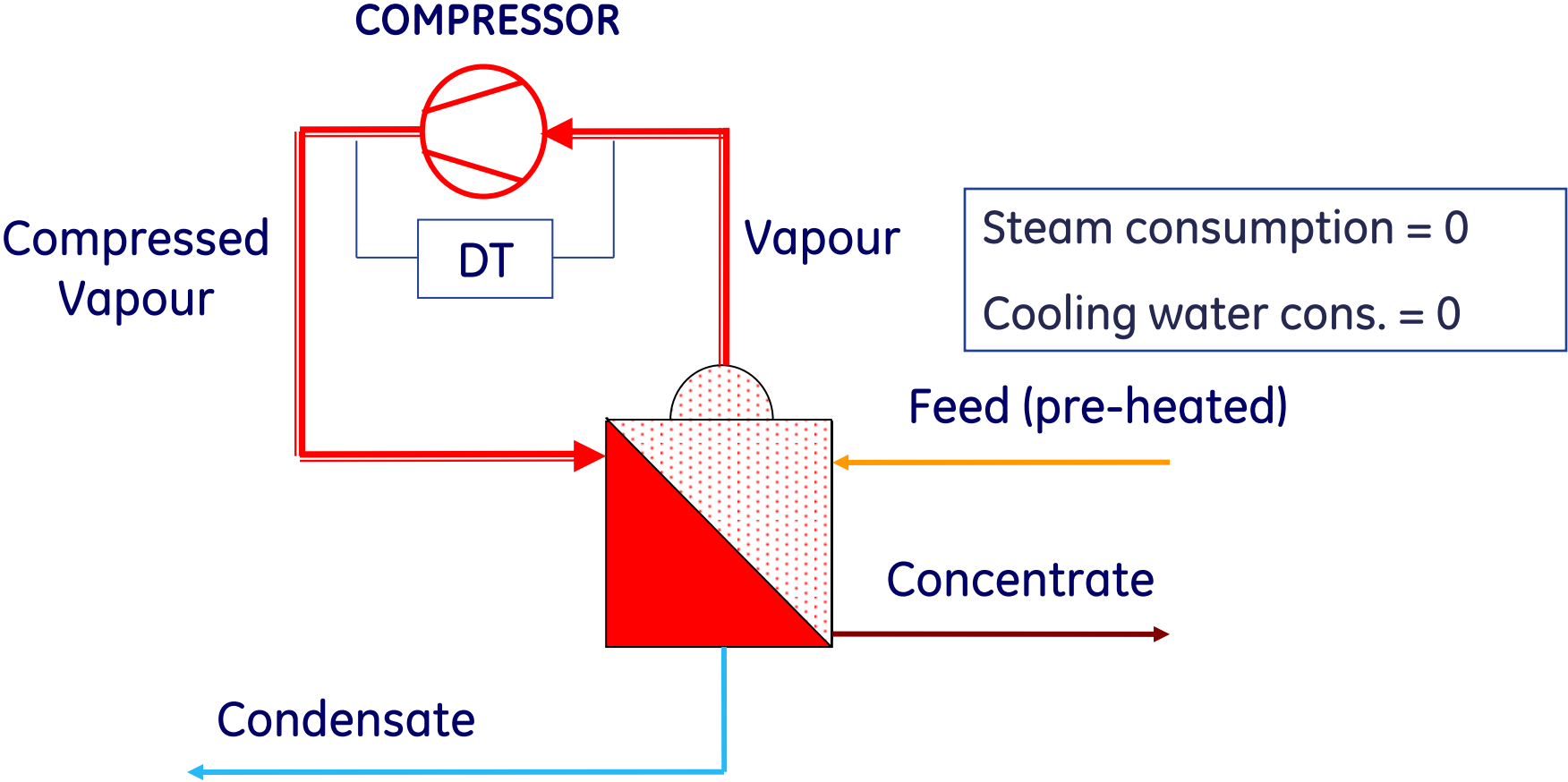
Principle of MVR-evaporation

MVR → Mechanical Vapor Recompression

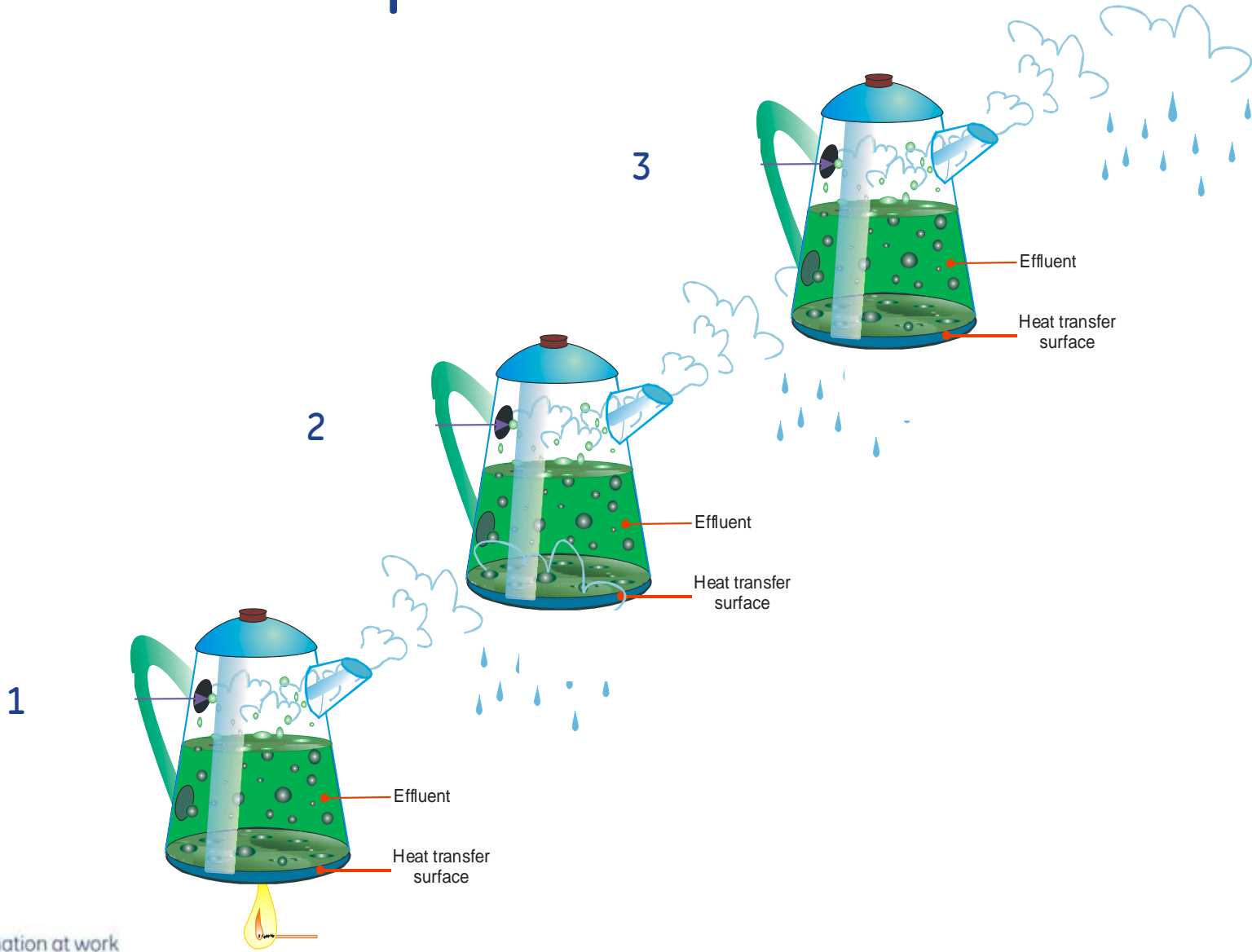


Vacuum system as example only... our systems are mostly atmospheric pressure

MVR Evaporation

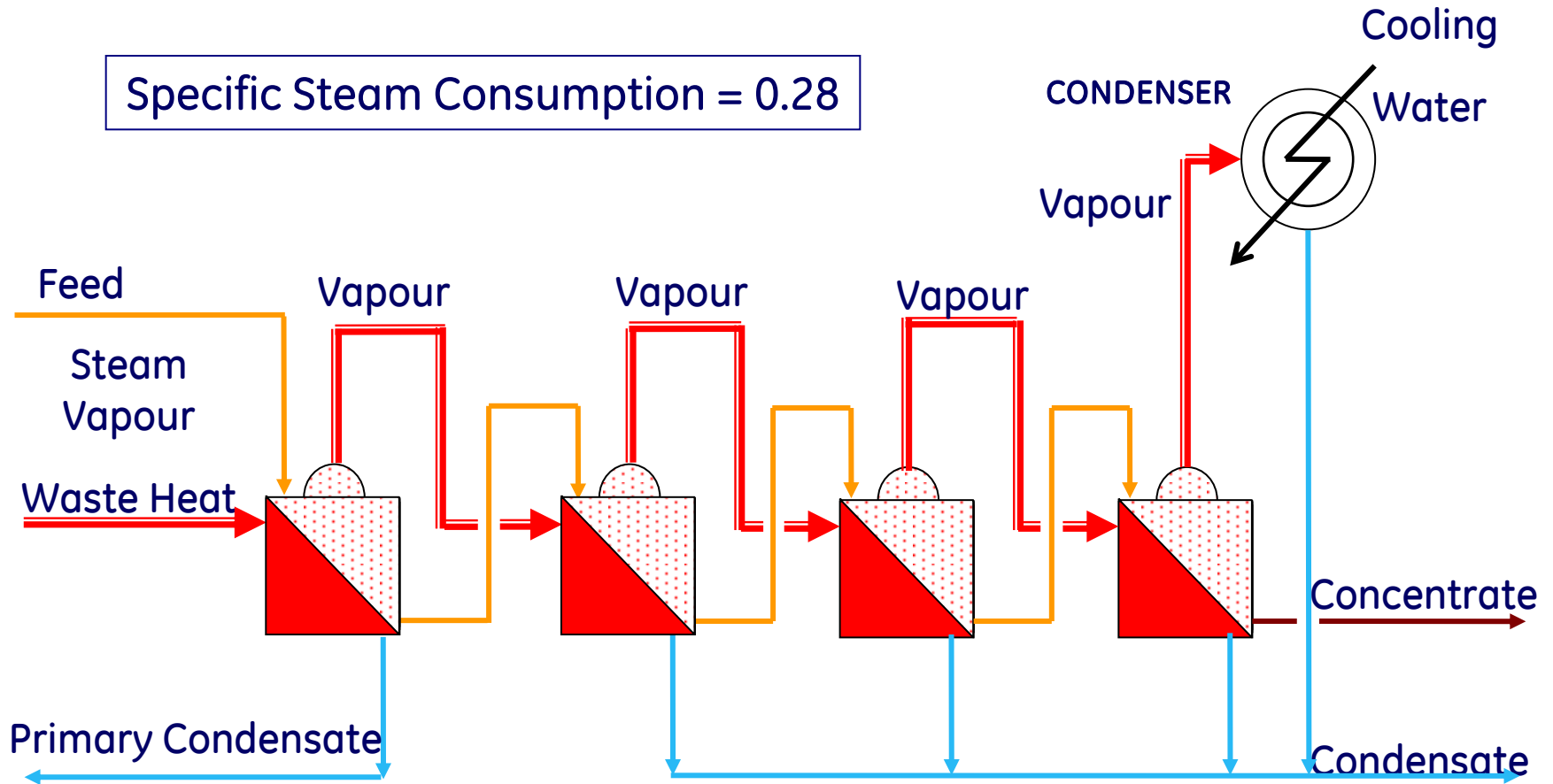


Multi-effect evaporation

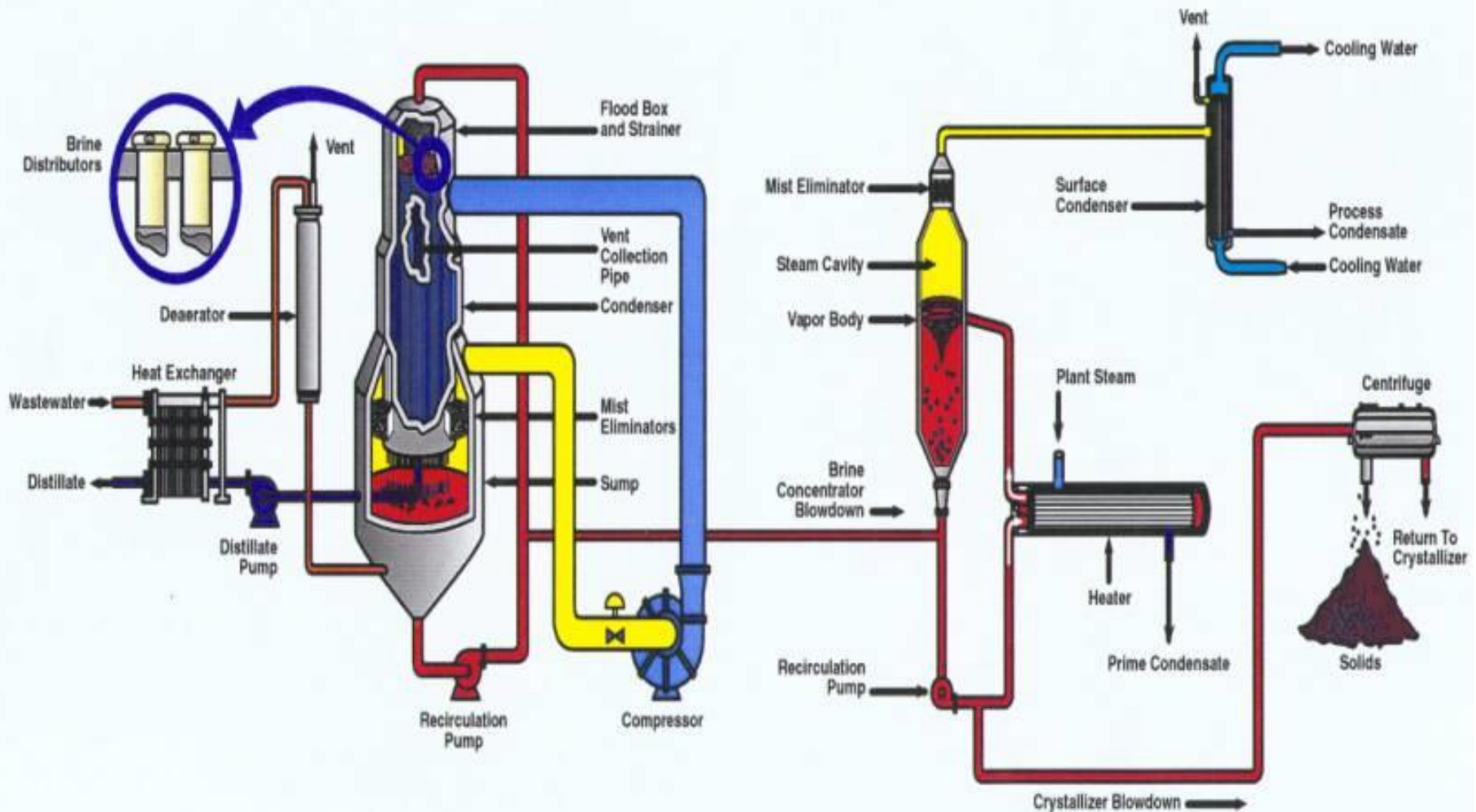


4-Effect Evaporation

Specific Steam Consumption = 0.28



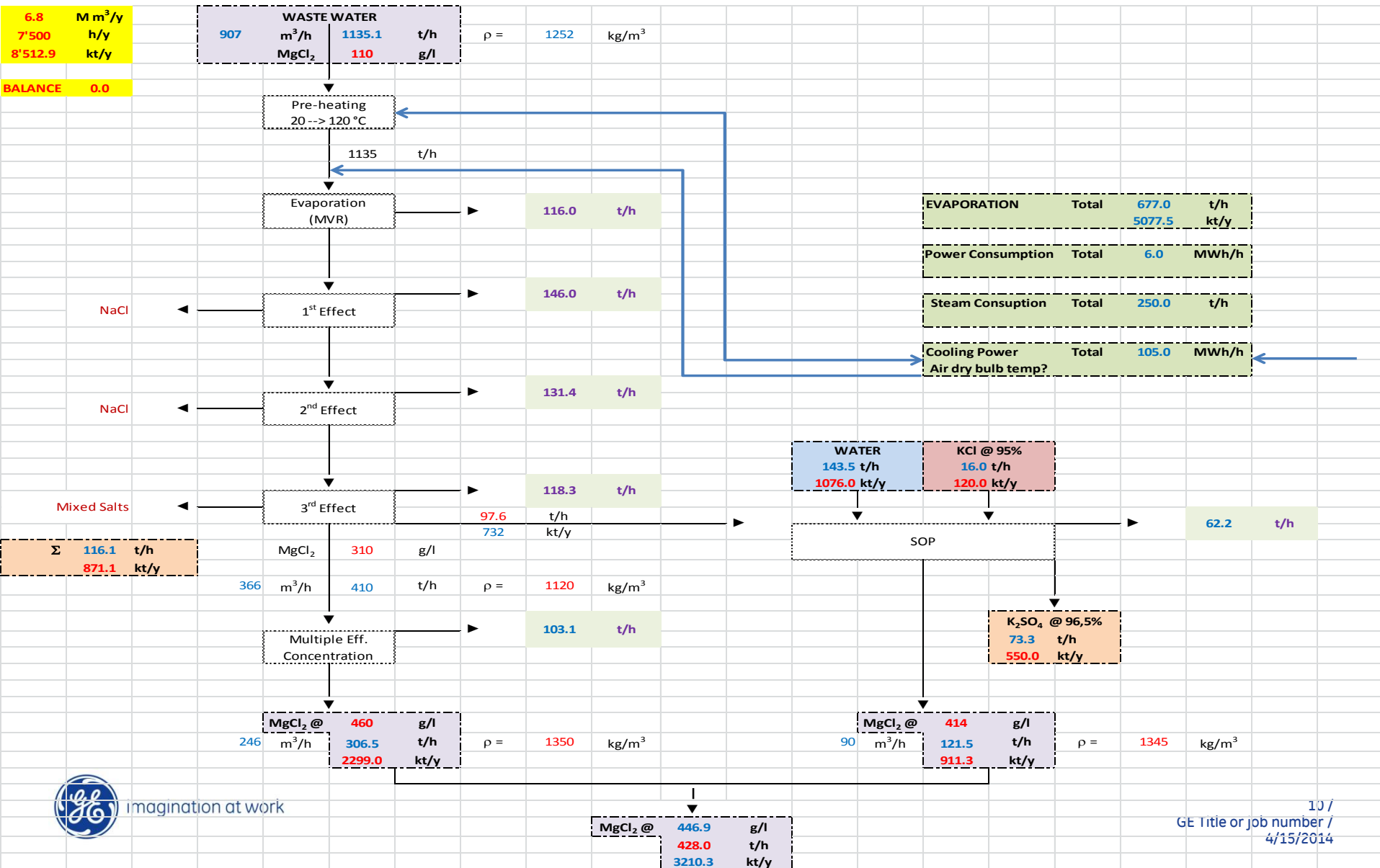
Evaporator and Crystallizer Technology



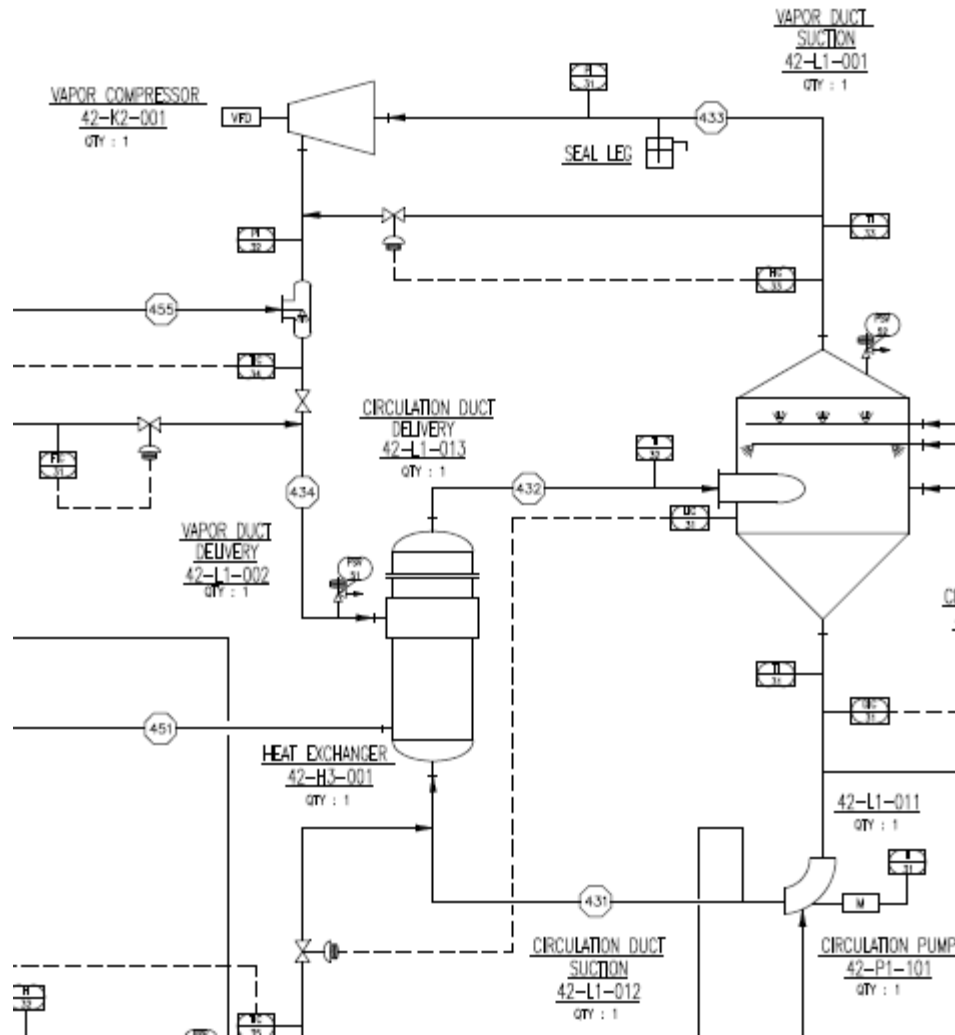
Result is achieved by the combination of evaporation & crystallization

Project-Balance

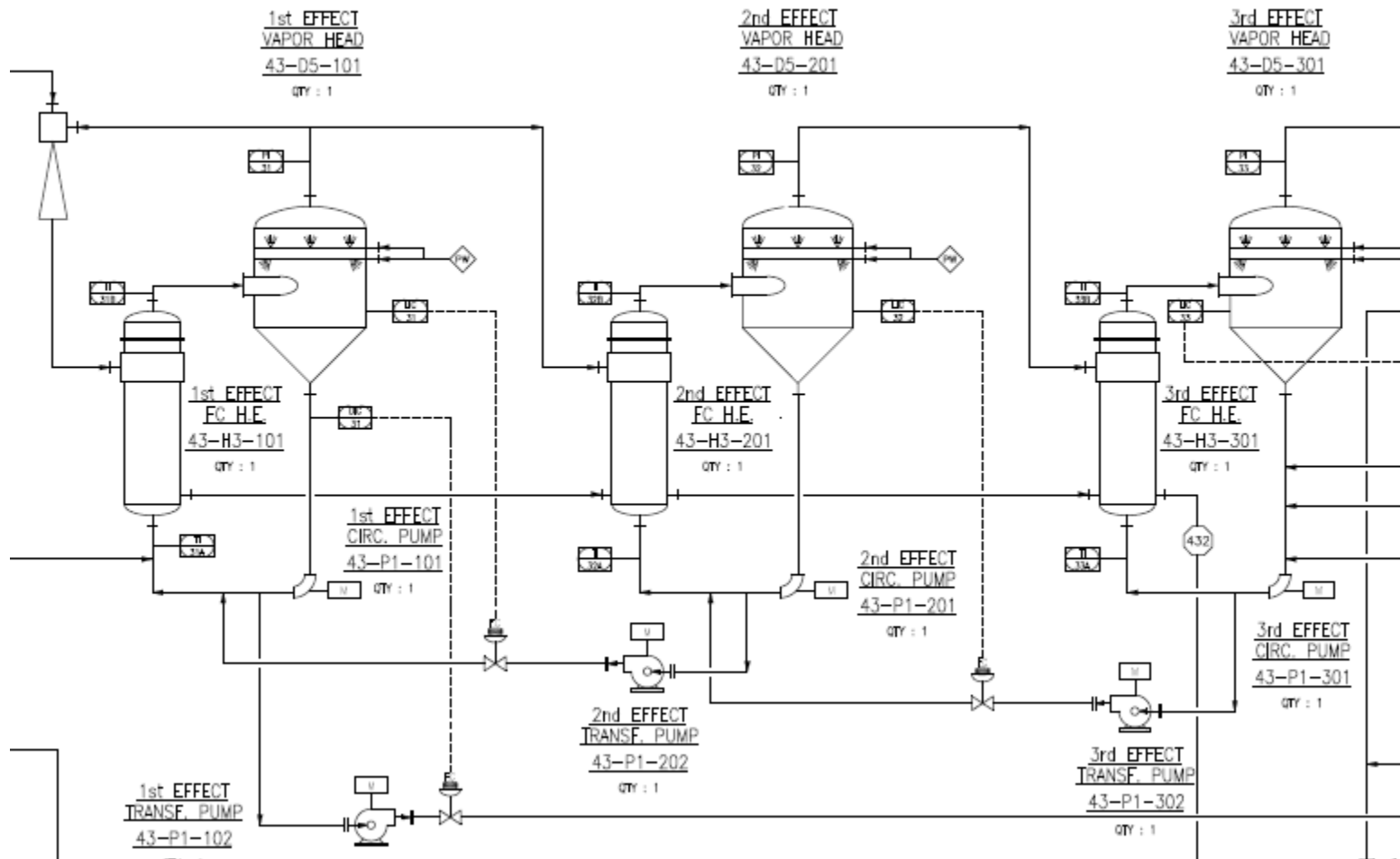
Overall Massbalance



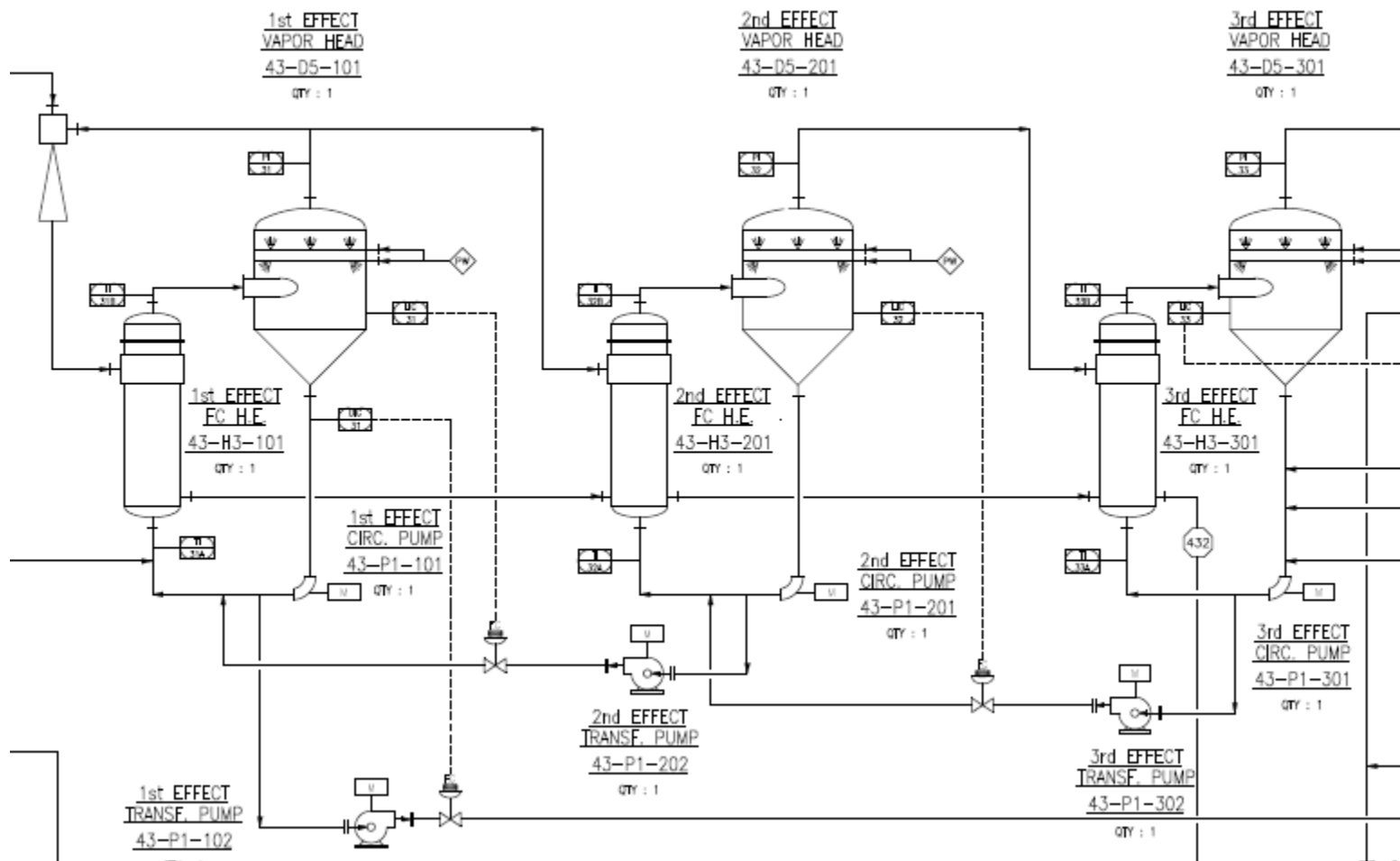
1. Step MVR



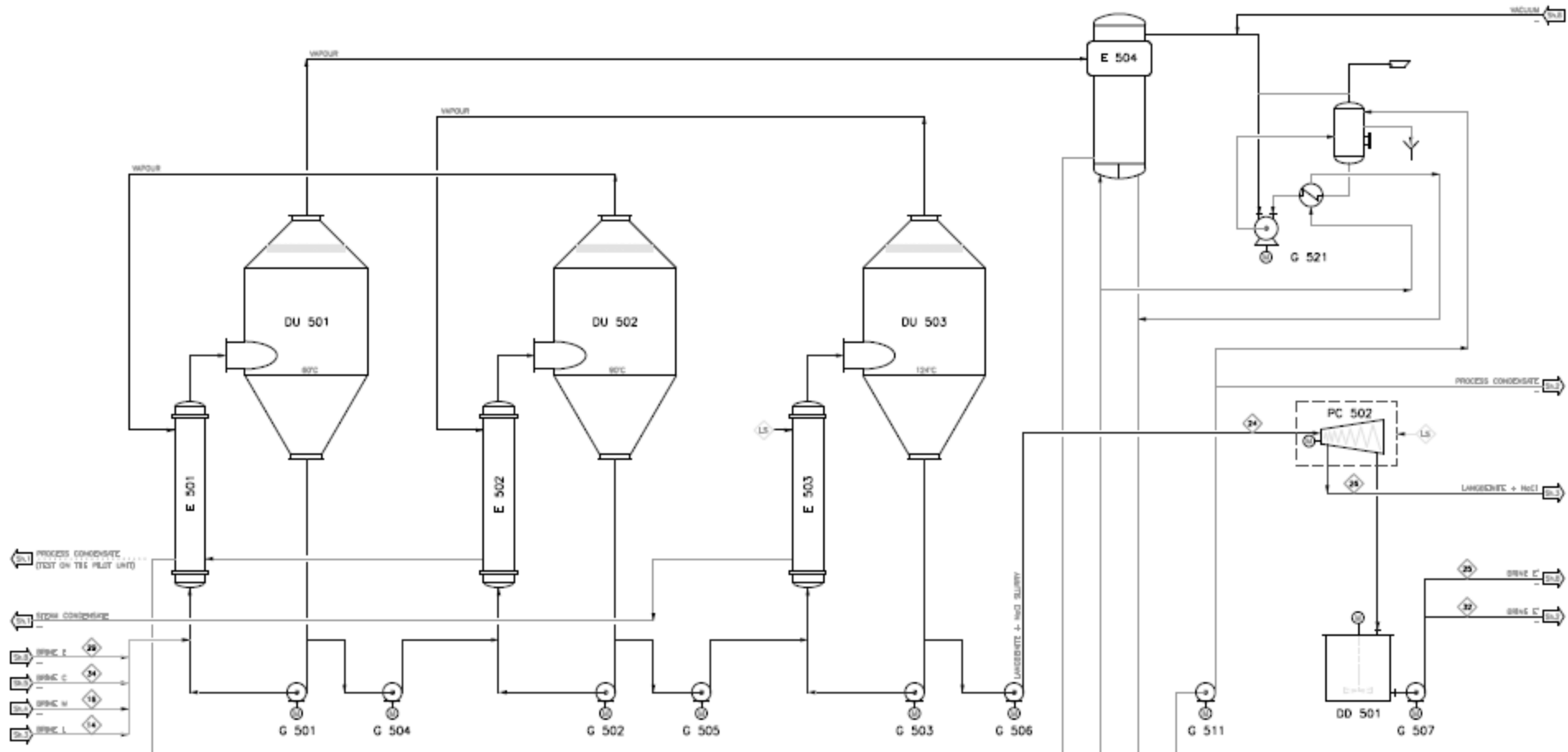
2. Step Triple effect Evaporation/Crystallization



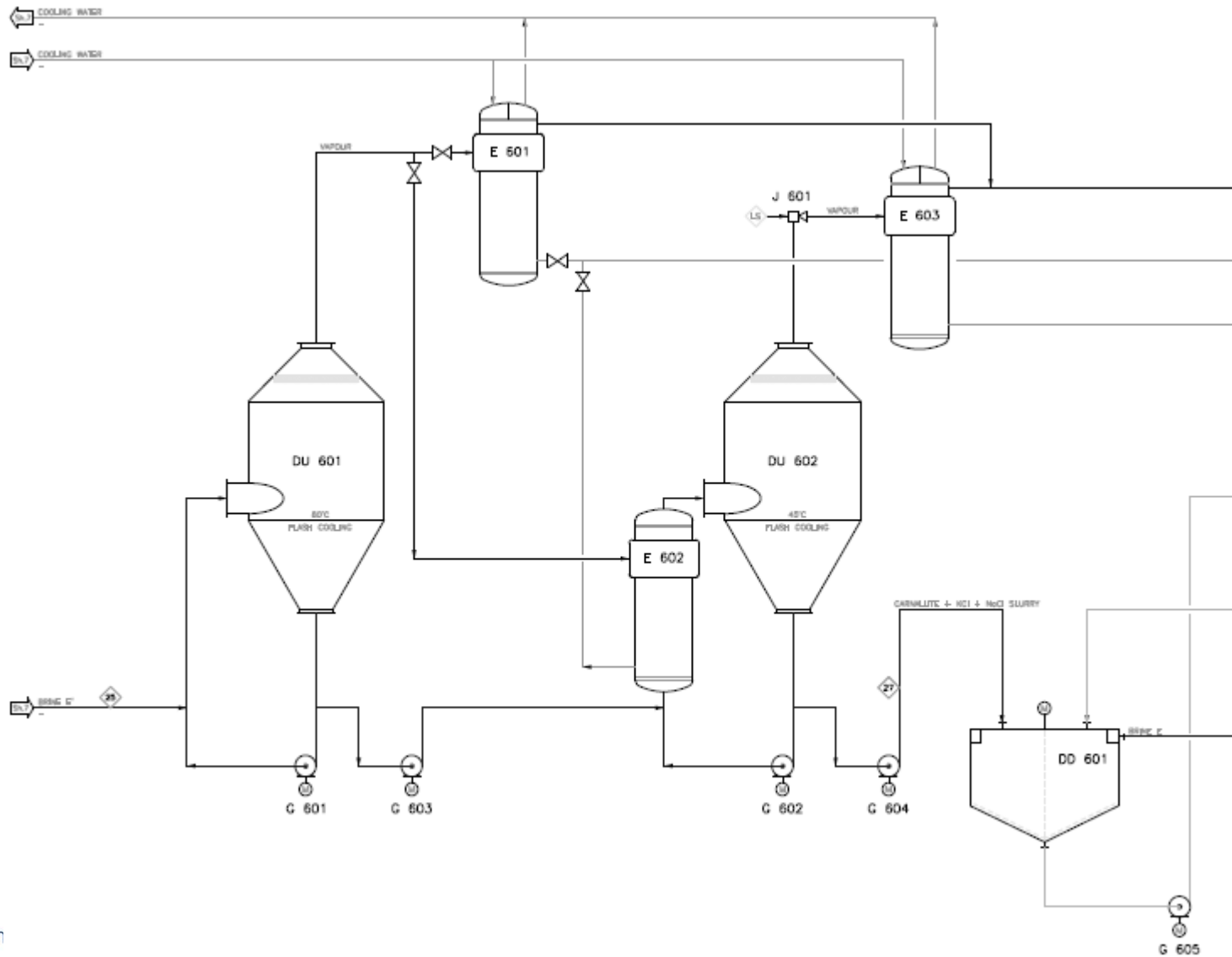
3. Step double/triple effect concentration



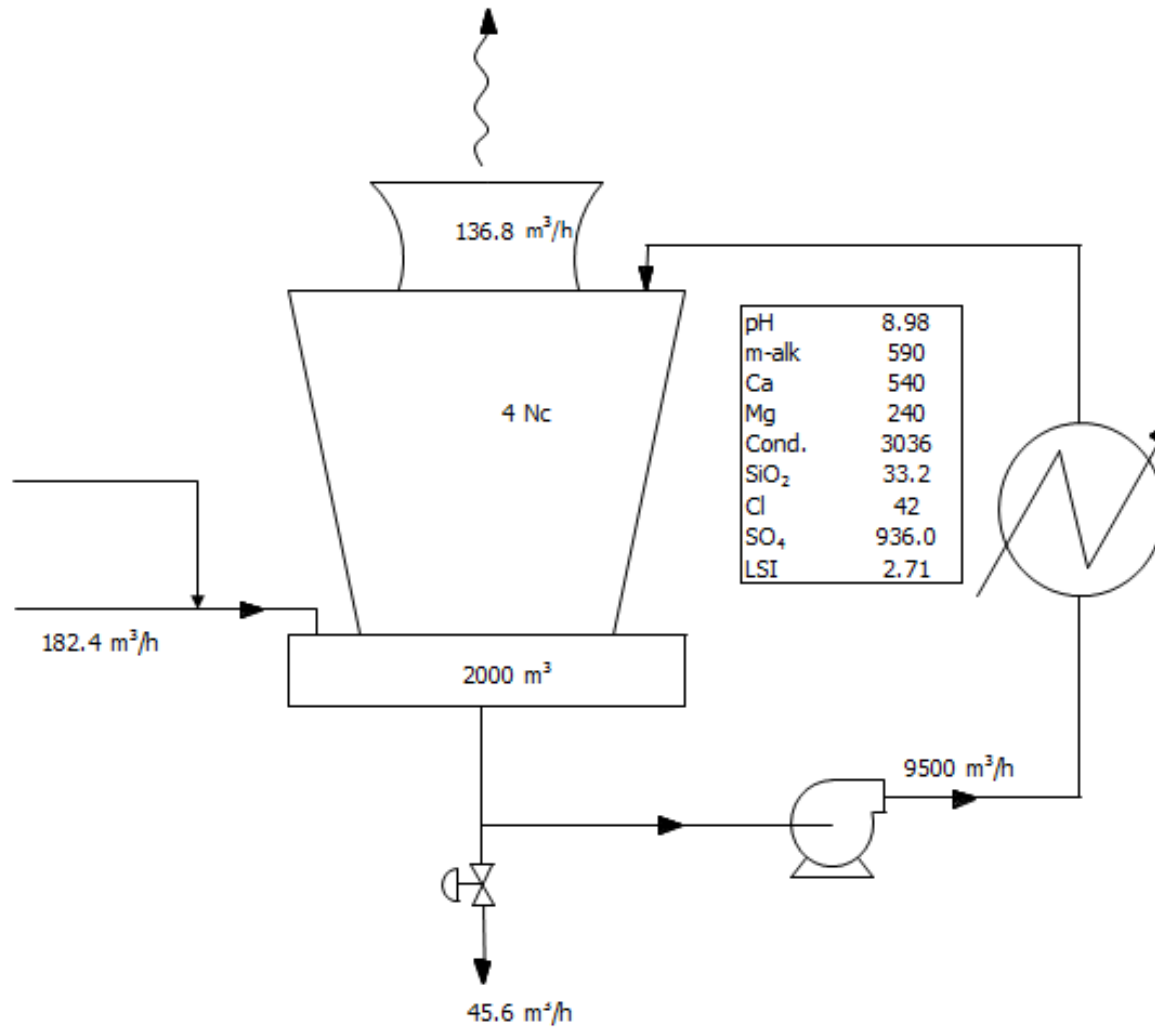
4. Step K_2SO_4 Crystallization



5. Pre-Step only Variant B



Condensate cooling



Consumption

Power Consumption	Total	6.0	MWh/h
Steam Consumption	Total	250.0	t/h
Cooling Power	Total	105.0	MWh/h
Air dry bulb temp?			

Equipment Price

Design Basis	Budgetary Price (+/- 30%)
• Evaporation Pkg.	~95% of price
• Crystallization Pkg.	~5% of price
Total System Price	€ 110,000,000

Total Turnkey est.

					<i>EQUIPMENT TOTAL</i>	100'000'000
cost % of equipment						
Miscellaneous Process Equipment (Piping, etc.)			5%			5'000'000
Field I&C and Control System			5%			5'000'000
Spare parts			3%			3'000'000
Civil works (foundations)			5%			5'000'000
Steel structure			10%			10'000'000
Installation			30%			30'000'000
TOTAL						158'000'000

THANK YOU!



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