

Regenerative Rankine cycle

In a regenerative Rankine cycle some steam is extracted from the turbine and is used to heat the water before it enters the boiler, although the extracted steam could have produced some work in the turbine. Is it smart to do this (and why)?

Answer: Yes.

Explanation: This is a smart thing to do because little work potential is lost, but a lot from the heat input is saved. The extracted steam has little work potential left, and most of its low temperature energy would be part of the heat rejected anyway. Therefore, by regeneration, a considerable amount of heat is saved by sacrificing little work output. This makes the efficiency of the system the highest.