

PROCESS INTEGRATION

Part 1: Heat Integration

Chapter 2: Cascade Diagram

by

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Chapter Description

- Aims
 - To construct a cascade diagram from data extraction table
- Expected Outcomes
 - Students are able to construct a cascade diagram from extracted data



In this lecture we will learn how to
construct a cascade diagram



From the table of extracted data

No	T source, C	T target, C	Heat duty, kW	CP	Type
1	220	60	3520	22	Hot
2	270	160	1980	18	Hot
3	50	210	3200	20	Cold
4	160	210	2500	50	Cold



Set $\Delta T_{\min} = 20 \text{ C}$

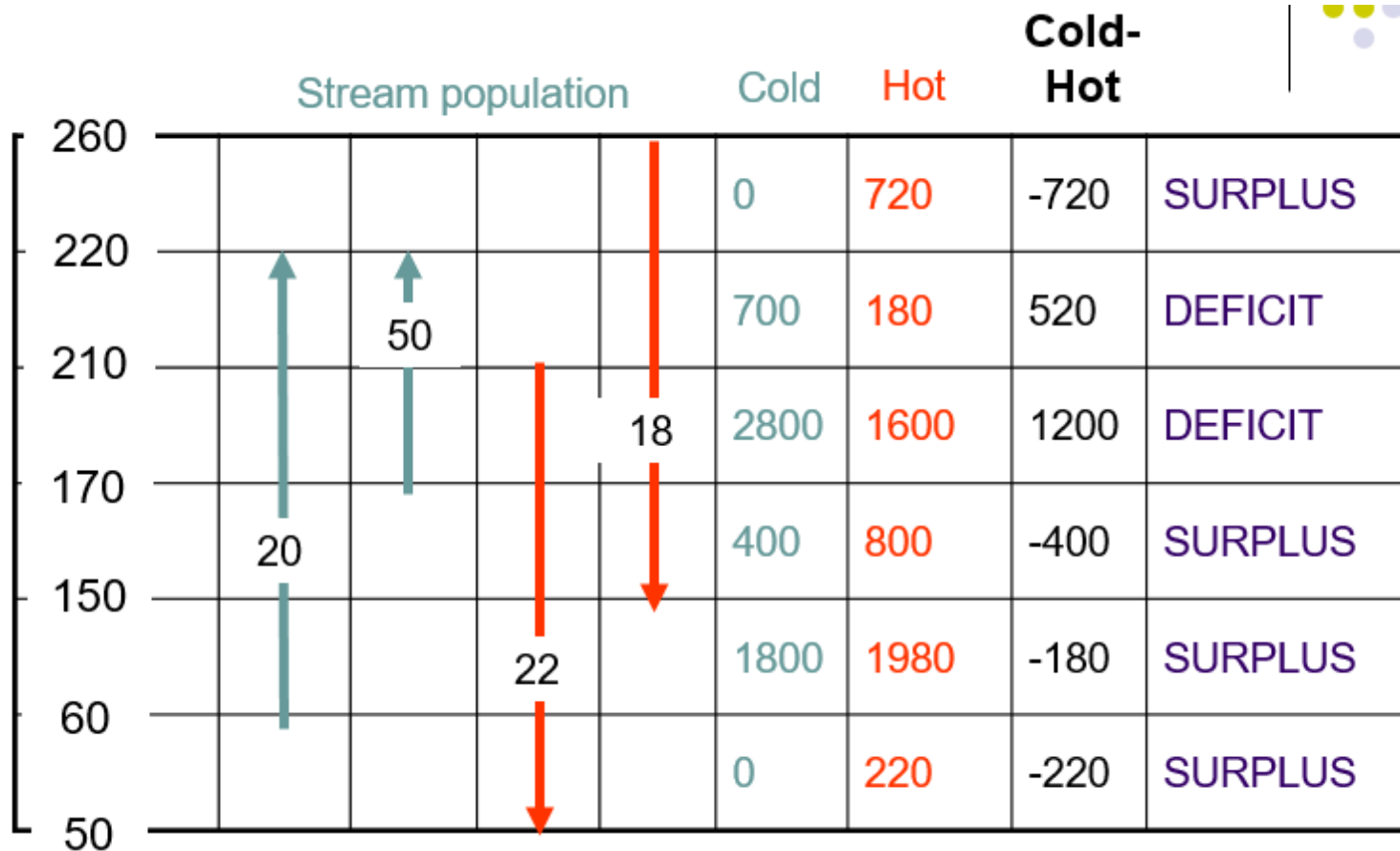
Shifted Stream Data

Hot - $\frac{1}{2}\Delta T_{\min}$; Cold + $\frac{1}{2}\Delta T_{\min}$

Shifted data

No	T source, C	T target, C	Heat duty, kW	CP	Type
1	210	50	3520	22	Hot
2	260	150	1980	18	Hot
3	60	220	3200	20	Cold
4	170	220	2500	50	Cold

Cascade diagram



From the cascade diagram

- The amount of energy transferred for each temperature interval is identified.
- Energy balance of the system can be evaluated.



Thank you

