or non-separated process phases, when such processing is aided by the reduced temperature.

According to the invention, a possible embodiment is to provide a heat exchanger for heat transfer between the compression unit outlet line fluid and the separator inlet line fluid. The outlet line from the compression unit is guided into the heat exchanger (heat transfer unit) which is connected to the inlet line of the separator.

One may possibly use all the fluid in the compression outlet line for the heat transfer. This meaning guiding all the fluids at the compression outlet line through a heat exchanger. Another possibility is to provide a separator unit at the outlet of the compression unit to separate out a part of the fluid at the outlet of the compression unit to lead through a heat exchanger with the fluid at the inlet of the separator. There is also the possibility of having two heat exchangers in parallel downstream of the separator arranged downstream of the compressor, one for each fluid phase out of the separator. Another possibility is to have a flow splitter at the outlet line of the compressor unit, to take only a part of the fluid through the heat exchanger. One may guide all the fluid from the compressor outlet line through the heat exchanger with the separator inlet line or only parts of the fluid and then possibly let the rest of the fluid bypass the heat exchanger. One possibility is to then combine the flows again after the heat exchanger, or another possibility is to lead one of the flows into another fluid line. Another possibility is to take a part of the flow at the outlet from the compression unit and mix this with the well stream at the inlet of the separator. This part of the flow may be a part of a multiphase flow or a part of a phase divided flow. The temperature increase in the process fluid can be achieved by recirculation of and commingling with process fluid that has been compressed in a pump or compressor, thus avoiding the use of a heat exchanger. In other words, bleed off a part of the compressed process fluid, relieve the pressure and guide it directly into the process stream to heat this. The bleed off may take place after or in a mixer to make sure an even distribution of phases in the two or more flows.

The compression unit in the form of a multiphase pump or compressor may, according to one embodiment, be placed after, or with other words, downstream of the separation station. By using a system according to the invention, one gets increased efficiency in the separator, but also cooling of the fluid flow after the compression unit. The separation station may comprise several stages and sub-processes. The multiphase pump or compressor can be placed between separation stages or between process parts, according to the requirements of these stages and process parts.

Any gas in the process fluid can be separated from other phases after the pump or compressor, according to the requirements of the stages and process parts. By doing this, one may have a heat exchanger at the inlet of the separator with only one phase in the flow through the heat exchanger. Another possibility is to have one phase through the heat exchanger and at least a part of the flow not flowing through the heat exchanger bled down in pressure and introduced in the process flow, to

CLAIMS

1. Subsea system comprising a separator ~~(1)~~ with an inlet line ~~(2)~~ and at least one outlet line ~~(3)~~ and a compression unit ~~(4)~~ with an inlet line ~~(5)~~ and an outlet line ~~(6)~~ and a heat transfer unit ~~(7)~~ for transferring heat between at least a part of a fluid in the inlet line ~~(2)~~ of the separator ~~(1)~~ and at least a part of a fluid in the outlet line ~~(6)~~ from the compression unit ~~(4)~~, wherein the outlet line ~~(6)~~ from the compression unit ~~(4)~~ is guided into the heat transfer unit ~~(7)~~ which is connected to the inlet line ~~(2)~~ of the separator ~~(1)~~.

2. Subsea system according to claim 1, wherein the compression unit ~~(4)~~ is a multiphase pump.

3. Subsea system according to claim 1, wherein the compression unit ~~(4)~~ is a compressor.

4. Subsea system according to one of the preceding claims, wherein the heat transfer unit ~~(7)~~ is a heat exchanger.

5. Subsea system according to one of claims 1-3 comprising a splitter downstream of the compression unit ~~(4)~~ to split out a part of fluid in the outlet line ~~(6)~~ of the compression unit ~~(4)~~, and guide said part of the fluid into the heat transfer unit, the heat transfer unit being a mixer ~~(7)~~, to mix with the fluid in the inlet line ~~(2)~~ upstream of the separator ~~(1)~~, during use.

6. Subsea system according to one of the preceding claims, wherein the inlet line ~~(5)~~ of the compression unit ~~(4)~~ is connected to the outlet line ~~(3)~~ of the separator ~~(1)~~.

7. Subsea system according to one of the preceding claims, wherein the outlet line ~~(6)~~ of the compression unit ~~(4)~~ is connected to a downstream wax precipitation unit.

8. Subsea system according to one of the preceding claims, wherein the heat transfer unit ~~(7)~~ is provided with an additional heat source.

9. Subsea system according to the one of the preceding claims, wherein the system comprises at least a second compression unit arranged upstream of the separator.

10. Subsea system according to one of the preceding claims, wherein the system comprises at least two separation stages, with a first and second separator.

11. Subsea system according to one of the preceding claims 1-4 or 6-10, wherein the heat transfer unit ~~(7)~~ is a heat exchanger ~~(7)~~, which heat exchanger ~~(7)~~ is arranged downstream of the compression unit ~~(4)~~ that is arranged downstream of one separator ~~(1)~~, and upstream of at least one other separator to heat exchange a process fluid upstream of a separation stage.

12. Subsea system according to one of the preceding claims 10 or 11, wherein the system comprises a heat exchanger ~~(7)~~ upstream of each separation stage.

13. Subsea system according to one of the preceding claims 1-4 or 6-12, wherein the subsea system comprises an additional separator upstream of the heat exchanger ~~(7)~~ and downstream of the compression unit ~~(4)~~, such that the heat exchange takes place in parallel with split phases or one phase is bypassing the heat exchanger ~~(7)~~ or mixed into a process fluid.

14. Subsea system according to one of the preceding claims 1-4 or 6-12, wherein the subsea system comprises an additional separator upstream of the heat exchanger ~~(7)~~, and a bypass line ~~(9)~~ for at least one phase around the heat exchanger ~~(7)~~.