

PROCESS SIMULATION CUP 2019

PSC Task Phases

Active Phase:

Phase 3

Start:17.06.2019

Description:

You did an amazing job and the profit of the changeover shifts was increased by more than a factor of two! And now, due to an increasing demand for biofuels, **the marked price of your plant's product has also increased by a factor of two, from 0.5 \$ per kg to 1.0 \$ per kg**. This makes a good changeover shift even more important.



But there are still many problems with the reboiler due to sudden changes in the set points. To avoid that, you can now enter smoother profiles by adjusting one additional ramp point per operation parameter.

For the decision variables some bounds exist:

- the switch time and the intermediated ramp times can be varied between 30 minutes and 480 minutes after the initiation of the changeover
- the intermediate ramp points for the set points for the reflux ratios can be varied between 0.1 and 40 and between 0.1 MW and 5 MW for the reboiler duties
- the second ramp points of an operation parameter must occur after the first ones



Phase 2

15.04.2019-17.06.2019

Description:

The good news is that you increased the shifts profit a lot by only adjusting the intermediate ramp points and by switching at the right time. But this leads to somehow extreme profiles for the column operation parameters. This might be improved by adjusting the ramping times. And by the way, the profit might even be increased further.

In Phase 2:

- the switch time and the intermediated ramp times can be varied between 30 minutes and 480 minutes after the initiation of the changeover
- the intermediate ramp points for the set points for the reflux ratios can be varied between 0.1 and 40 and between 0.1 MW and 5 MW for the reboiler duties



Phase 1

15.01.2019 - 15.04.2019

Presently, you only decide for a different time for switching to the product tank and different ramp endpoints for the 270 minutes long ramps of the set-points. Can you convince your shift colleagues and the management to accept your new parameters? It all depends on the profit increase you achieve during your shift!

The switch time can be varied between:

- 30 minutes and 480 minutes after the shift
- the intermediate ramp points at 300 minutes for the set points for the reflux ratios can be varied between 0.1 and 40 and
- the reboiler duties can be varied between 0.1 MW and 5 MW

The restrictions occur due to limitations in the measurement ranges of the installed flow measurement devices. You might specify threshold values. However, it might be impossible for the process to reach them.

The good news is that you get the steam almost from (only 10 cents per metric ton) from an adjacent plant. So, use as much as needed.