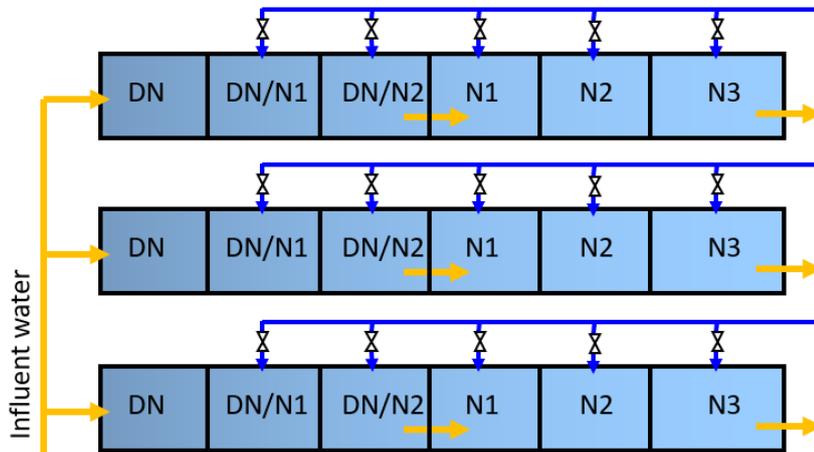


Process stability in aeration control

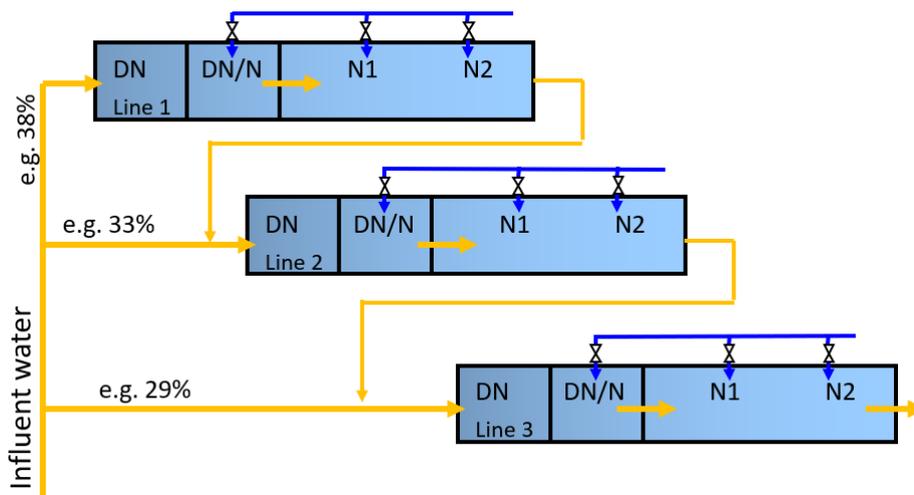
Part 2: Use of special algorithms in multistage aeration plants

Multistage aeration plants can be of two types:

1. Multistage nitrification with parallel feeding of the water



2. Multistage nitrification with a split of water feeding



From control point of view both have the same demand: the oxygen input must be adjusted in a way that degradation/ nitrification takes place in all the aerated tanks respectively zones. Changing inlet load, variable concentration and activity (due to water temperature summer/ winter) of bacteria must be taken into consideration.

Running the tanks with fixed DO-setpoints in high-load phases aeration can be not sufficient and in low-load phases there is may be no ammonia to get oxidized in the last zone. Same problem with summer/ winter operation. Due to lower water temperature nitrification is going slower, a higher oxygen demand is needed in the final zones.

The last zone needs to be monitored for oxygen requirement and using a feedback control strategy the DO-setpoint in the first zones must be adjusted.

Based on ammonia concentration which can be measured at the inlet (feed-forward strategy) or at the outlet (feedback strategy) e.g. in the common effluent channel a decision must be made, if flexible zones are required for aeration or if they can be used for denitrification.

Another possibility is to install the ammonia sensor somewhere in between. The advantage of this position are:

- having a single information in each line (compared to common effluent channel for all the lines)
- getting an information about degree of nitrification respectively required oxygen potential
- having still some aerated volume downstream for further actions

So depending on the position of the sensors, the limits of the DO-setpoints can be set accordingly.

Related VACOMASS® products:

VACOMASS® flexcontrol with the unique flexalgorithm – function DO-SET KASK