SOLUTION: EXCEL BASED TOOL FOR EMERGENCY SITUATIONS

The purpose of the tool is to give clear situation-dependent instructions for the industrial operator, thus "translating" the accidental load to terminology that the WWTP industry operator understands.

In emergency situations, industry operators in control rooms determine the content and estimate the amount of the leak. When the operators feed the parameters into the tool, it can estimate the severity of the leak (no problem/intermediate/emergency) for the sewer, and is able to give instructions to the operator on how to proceed. If the tool gives an order to contact the wastewater treatment plant, the industry operator is able to give essential information to the duty officer of the WWTP, who can start actions to mitigate the leak.

CHALLENGE

A disturbance in the industrial process, i.e. when wastewater of abnormal quality or quantity is suddenly discharged to the municipal wastewater treatment plant (WWTP), cause specific challenges for the treatment process at the WWTP. In these situations, in addition to monitoring instruments, well-functioning and clear communication between the municipal WWTP and industry is crucial, and it is decisive to agree on the course of action.

INSTRUCTIONS AND GUIDELINES

1. Determine all essential raw materials, intermediate products and final products which can leak into the sewer
2. Determine corresponding key parameters of products important to the waste water treatment plant (e.g. COD, BOD and fats)
3. Write excel formulas which calculate the loads during a leak using the volume and concentration of the components during the leak
4. Announcement levels are agreed together with the WWTP and industry
5. Train the industry operators and WWTP duty officers together!

Estimates used e.g. in the dairy industry
For COD: 1kg COD per 1kg carbohydrate, 1.5kg COD per 1 kg protein and 3kg COD per 1kg fat
For BOD: for milks, multiply COD by 0.60-0.65, for creams by 0.5, and for whey by 0.7
For Nitrogen: divide the protein content of the product by 6.38.

Example of an excel sheet used in the emergency tool

HISTORY OF THE TOOL

The tool was originally developed for the dairy company Valio Haapavesi, Finland site, to standardise communication with the municipal WWTP in the case of a severe leak to the sewer. Earlier, all of the Valio dairy sites had written emergency instructions to call the WWTP once they noticed a leak. The instructions contained a list of products with limit values for the call but were too difficult to find and understand at Valio. The dairy operators sometimes failed to inform the WWTP as they underestimated the situation or the duty officers at the WWTP did not understand what the leak meant for the treatment process and failed to take the necessary precautions.