

Efficiency and Flexibility in Water Analysis

Efficiency and flexibility were the words which laboratory manager Henrik Lindblom used when describing the goals for the new instruments selected for water analysis. Increased analytical demands at VA SYD resulted in a re-organisation at their different laboratories. Recently implemented Thermo Scientific™ Gallery™ analysers, Gallery and Gallery Plus, helps remarkably to save hands on time and to manage their daily workload.

“VA SYD’s future plans include connection to the LIMS system to further increase the efficiency in the laboratory.”



Laboratory manager Henrik Lindblom in front of the Klagshamn waste water treatment plant

VA SYD is distributing drinking water, cleaning waste water and handling solid waste coming from households in southwest Skåne area, Malmö, Lund, Burlöv and Eslöv, in Sweden. The collaboration started between Lund and Malmö cities in 2008, later Burlöv and Eslöv joined. With 350 employees VA SYD is serving over a half a million people by continuously controlling the quality of drinking water and monitoring the cleaning process of waste water during different parts of the process. VA SYD is also

responsible for monitoring the condition of water delivery systems. Besides monitoring their own water sample supply, VA SYD is serving also external customers, like food and colour industry factories to help them to control their waste water processes. That co-operation goes back to 1980's when the environment of Malmö was scanned for possible pollutants, like lead and cadmium.

Vision

Three years ago, laboratory manager Henrik Lindblom started to organise the laboratory work in VA SYD differently. His vision was that each laboratory should be specialising in different areas and that the laboratory's analytical workflow would be continuous and not batch oriented. At the time, before the re-organisation, all waste water samples from external customers were analysed in the Bulltofta laboratory and the same laboratory was also analysing the drinking water samples. Between testing the waste water and drinking water batch, the systems needed cleaning.

Increasing number of samples and tests, today around 230 000 tests per year, required the analytical workflow to become more efficient. Today all waste water samples are analysed in four waste water laboratories by one to four laboratory engineers at each site. One group manager is supervising two laboratories. Each laboratory situates in connection with a waste water treatment plant. Bulltofta laboratory, having 18 employees, is divided into two departments, one monitoring drinking water and the other analysing environmental samples, e.g. sludge from wastewater treatment plants and soil samples from surrounding farms.

New Analytical Platforms

Due to the increased analytical demand and the need to have a more

efficient workflow, Henrik Lindblom decided to renew the instrumentation used for analysing water samples. He invested in the automated photometric analyser, Gallery Plus from Thermo Fisher Scientific. Gallery Plus is a discrete analyser which is capable of analysing several parameters from a sample simultaneously. This first analyser, Gallery Plus was implemented in Malmö, at Sjölanda waste water treatment plant, where it replaced two older instruments. The combination of self-tutorial software and easy to use instruments makes Gallery Plus very user-friendly. You don't have to be an experienced user to be able to run the system, says Lindblom. One important goal was that the analyser needed to be so easy that a summer assistant should be able to learn and routinely run the instrument within one week. Mr. Lindblom says that two training days are enough to use Gallery routinely. The increasing number of samples makes it impossible to have any interruptions in the workflow, e.g., during a sick leave. The incoming samples need to be analysed daily, explains Lindblom. Another automated discrete analyser model, Gallery with a lower throughput than Gallery Plus, was installed at Klagshamn and at Ellinge waste water treatment plants.

Saving Hands-on Time

In Sjölanda laboratory approximately 50 samples per day are analysed with Gallery Plus. From each sample usually five parameters are measured, ammonia, nitrite, total nitrogen, phosphate and total phosphorus. Sjölanda laboratory staff consists of one group manager and three laboratory engineers. Gallery Plus has replaced a more complicated instrument which needed an expert user to operate. Gallery Plus is acknowledged by Lindblom for its daily simplicity to start up. It takes not more than 15 minutes before Gallery is operational no matter if you are an experienced or a less experienced user compared to up to one hour with our previous system, says Henrik Lindblom. Gallery Plus is using disposable, plastic cuvettes which mean that there is no glassware to take care of and wash afterwards. Automatic dilution features also get positive feedback from Mr. Lindblom. – As less time is spent for manual sample handling, we are more effective. Another clear advantage is the time savings as no reagent preparation is needed. Ready to use system reagents are easy to work with. There is no method change-over time with discrete analysis compared to the previous method. For example if there is a problem in the on-line



Group manager Clara Krantz with Thermo Scientific Gallery Plus analyser

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process and the laboratory needs to analyse nitrogen in a sample urgently while phosphorus is being analysed, you do not need to change reagent and wash pumps before being able to analyse that sample. You just insert the sample and request the test. With our previous instrument one sample measurement could take even one hour before the result was available. Gallery gives flexibility as we are able to report results quickly to customers even when additional test requests are interrupting the routine workflow, says Lindblom.

Expanding the Workflow Automation

VA SYD's future plans include connection to the LIMS system to further increase the efficiency in the laboratory. Currently results are reported after analysis separately. Both Gallery and Gallery Plus can be connected to the laboratory information management system, reducing time to report the results. Gallery reads the information from bar-coded sample tubes, which is a clear advantage and will increase efficiency even more when the LIMS is incorporated. Capability to read the barcode and get

sample ID, origin of the sample, method and analysis information completely automatically reduces manual work and the risk of human errors.

Future

Laboratory manager Henrik Lindblom expects the water and waste water management cooperation of VA SYD to expand with at least a couple of new municipalities within the next five to ten years.

This means that a higher number of samples need to be analysed and the workflow in the laboratories need to be further optimised. For example from the beginning of 2013 the number of nitrogen samples analysed daily has doubled from 20 samples up to 40 samples per day at Sjölanda laboratory.

Lindblom is convinced that the Gallery analysers will help to manage the growing workload in the coming years. Excellent correlation to existing flow injection analysis and manual methods, short training period, reduced hands on time when



Laboratory engineer Roaam Al-Sclawi with Thermo Scientific Gallery analyser

analysing the samples and a short time to result with Gallery and Gallery Plus are clear advantages according to laboratory manager Henrik Lindblom.