

Hong Kong Water Supplies Department Effectively Tracks 170,000 Samples Per Year Through PerkinElmer LABWORKS LIMS



Hong Kong today enjoys one of the safest drinking water supplies in the world. With proper treatment and stringent quality monitoring and control, its water quality complies with the chemical and bacteriological guideline values for drinking water recommended by the World Health Organization (WHO).

Throughout the production process and in the water distribution network, the quality of the treated water serving 6.8 million people is closely monitored by the Water Science Division laboratories. More than 170,000 samples per year are regularly taken at intakes, storage reservoirs, treatment works, service reservoirs, trunk mains and customers' taps for chemical, bacteriological, biological and radiological tests.

The Hong Kong Water Supplies Department (WSD) has committed continuous efforts to enhance the performance and competence of their laboratories to the highest level. The Mainland East Laboratory and Pak Kong Laboratory were accredited in 1996 and 2000 respectively by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for a number of tests under the category of environmental testing.

The HOKLAS technical criteria are based on the requirements of the ISO/IEC 17025, which also meets the principles of ISO 9001.

Hong Kong WSD reviewed the available commercial Laboratory Information Management Systems (LIMS) to meet the diverse operational requirements in laboratories

and chose to purchase and implement the PerkinElmer LABWORKS™ Enhanced Security (ES) LIMS.

The standard LABWORKS system uses Northwest Analytical's (NWA) Quality Analyst for SPC-based quality control functions. At Hong Kong WSD's request, PerkinElmer added additional SPC capabilities using ActiveX components from NWA's embedded real-time SPC product, NWA QAX, to meet all of their specified quality requirements which are similar to EPA-related requirements.

The WSD's requirements for a LIMS system included QC analyses for every analytical batch to track accuracy (spike recovery) and precision (deviation

between replicates). The LIMS was required to perform automatic accuracy and precision calculations and flag all QC exceptions at result entry time for continuous monitoring of laboratory performance.

The most current standards require the use of SPC and moves control charting from an after-the-fact mode to active analytical process management. This includes not only using control limit and warning limit violations, but also incorporating the more sensitive pattern rule violations.

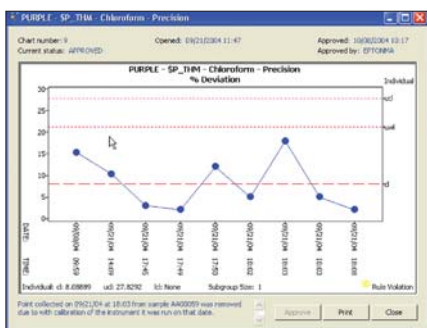


Figure 1. Precision control chart for organic determinand.



Figure 2. Close monitoring of Giardia and Cryptosporidium.

In addition to more aggressive SPC use, the WSD required additional statistical functions including tracking, evaluating and charting QC data by each of sixteen separate analytical “teams”. Samples were assigned to qualified team members before any analysis was performed. Analysts had to be able to:

- Annotate individual data points on charts during review and approval (these remarks become part of permanent LIMS data).
- Replace specific data points before chart approval
- Put in place Dynamic Control Limit Tracking

- Make a permanent record of chart approval (who, when and comments entered)

All of the charts were made read-only (locked) after approval.

PerkinElmer was able to add the additional SPC capabilities to LABWORKS by using NWA QAx. By embedding individual ActiveX components into LABWORKS, PerkinElmer then gained complete control over all chart parameters and was able to successfully meet all advanced requirements.

For more information, visit www.wsd.gov.hk/

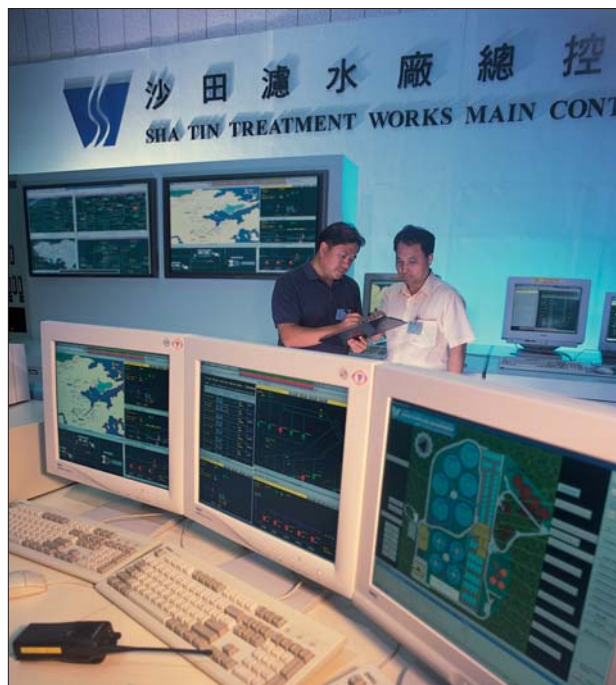


Figure 3. SCADA system at Sha Tin Treatment Works.

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