MEASUREMENT AND REPORTING

Measure better, manage better

Using basic tools to ensure more accurate reporting

Sappi's Ngodwana Mill has developed an innovative predictive performance model to track how its use of resources and the waste generated is influenced by production.

The United Nations estimates that global demand for water will grow by 50% by 2030. At the same time, globally, over 80% of the wastewater generated by society flows back into the ecosystem without being treated or reused. In addition, partly to help maximise yields to meet demand, usage of chemical fertilisers and pesticides has increased in recent years, both in industrial and small farming, making agriculture a potential source of environmental pollution.

Sappi's production processes and its primary input, woodfibre, depend on water. Globally, the Group returns 93% of the water it extracts back into the environment after treating and cleaning it. Of the 7% balance, approximately 4% leaves the mill during production and 3% is lost to the environment.

As part of Sappi's commitment to managing an essential component of its natural capital, the company tracks its sustainability performance in terms of water, and fuel usage (comparing renewable fuel use to fossil fuel use) and the amount of waste generated. Annual and long-term targets are set to reduce the use of water, energy and waste across Sappi's operations. These targets are expressed in resource use or waste per air-dried tonne of paper or pulp.

Sappi's Ngodwana Mill has developed a predictive performance model that tracks how resource use and waste is influenced by current production, and how this could change in future. The model focuses on the measurement and allocation of fresh water.

Investigations indicated that a significant portion of the mill's fresh water consumption was not allocated to a specific plant and was 'unaccounted for' in the records [ML/d]. Because there was no record of where the water was used the water use calculations were not reliable. Freddie Grobler, senior process engineer in the Ngodwana Mill technical department, says if water use [ML/d] is reported as unaccounted it is very difficult for the mill to identify opportunities to save water and reduce water use.

To understand and reduce its unaccounted water volume, Ngodwana Mill followed the following methodology:

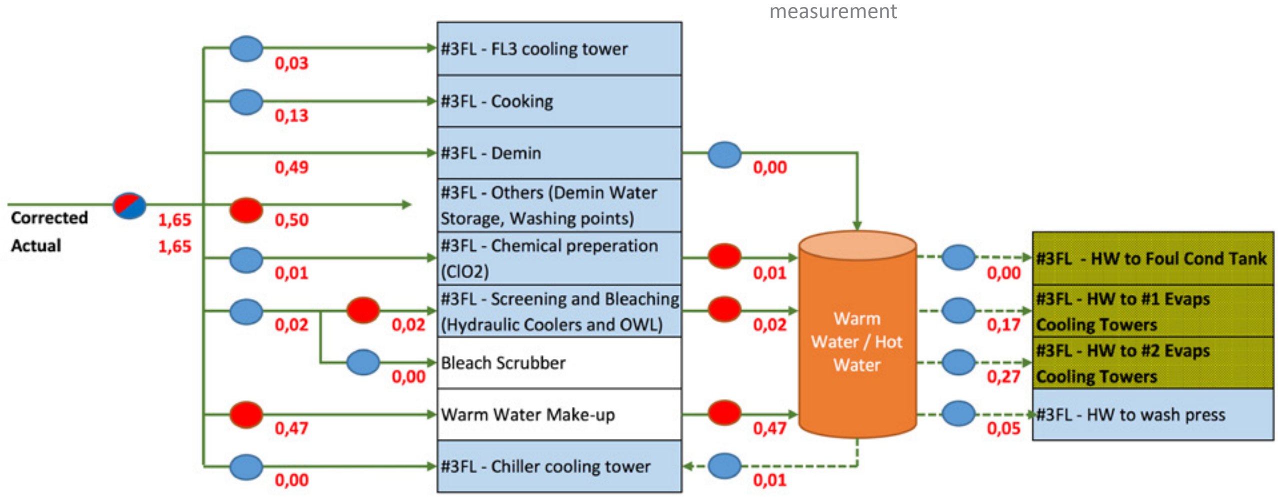
- **Understanding the system and determining what is measured**

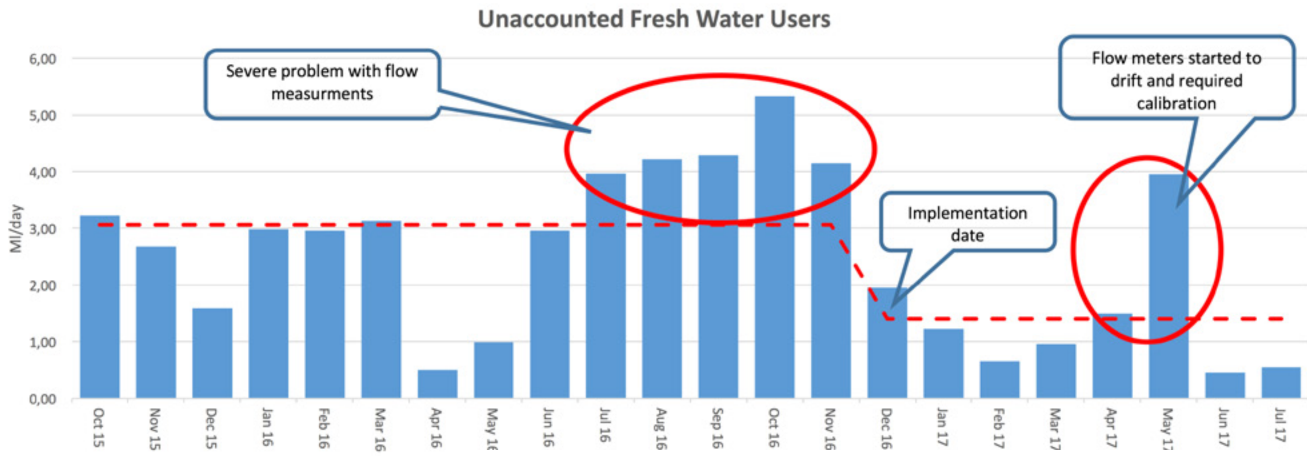
  The mill tracked the plant's pipelines and tapped into its process engineers' knowledge base to produce a simplified schematic diagram which identifies the flow meters and their location. Schematic 1 is an extract from the diagram.

- **Interpreting measured and calculated data**

  The original fresh water report only took the main flow meters that supplied water to the different production sections, into account. The balance generated and the schematic determined that some of the main flows did not tie up with the measured internal flows. This was concerning because it was not known which flow meters were correct.

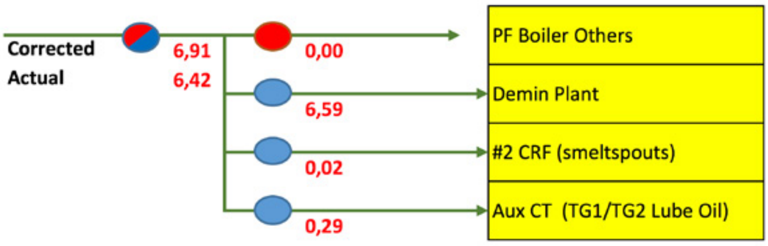
SCHEMATIC 1: Red dots = calculated flows. Blue dots = flow measurements. Red/blue dots = corrected flow measurement





When reporting, if the sum of the internal flows was higher than the total measured flow, the sum of the flows was used. If the total flow was lower than the sum of the flows, this indicated that there was a problem with one of the flow meters and an investigation was triggered.

Schematic 2 is an example of the above (the sum of values, 6.91Ml/day, is higher than the actual flow of 6.24Ml/day).



SCHEMATIC 2: Red dots = calculated flows, Blue dots = flow measurements, Red/blue dots = corrected flow measurement

With the implementation of this philosophy, the mill was able to account for each section's water usage more accurately. It also highlighted problem measurement areas.

Conclusion

As the saying goes, 'you can't manage what you don't measure'. In the past, it was difficult to implement fresh water saving projects at Ngodwana Mill because water was not allocated to the correct sections. In addition, each section focused on its own water usage and the water that was not accounted for was not managed by any section.

"By just going back to basics (a simple mass balance) we were able to allocate unaccounted water usage to the different sections, indicate flow measurement problems and ensure that the necessary focus was given to correct inaccurate measurements. This was an important step in understanding the mill's water balance so that we could identify water saving projects and achieve our sustainability targets," said Grobler. ■

Ultrasonic sensor for remote water level measurement

Instrotech now stocks the Senix ToughSonic CHEM range of ultrasonic sensors which are in service in some of the world's most demanding and corrosive industrial environments

Measuring a wide variety of materials including levels of liquid chemicals in the paper and food processing industries, ToughSonic CHEM sensors are sealed in Kynar® PVDF housings for protection against solvents and can withstand total immersion in harsh chemicals, both acids and bases, without damage.

They include the same full-epoxy potting, heavy-duty electronics, ruggedized-piezoelectric transducers, and UV-resistant cables that make these sensors robust and durable.

Several fully configurable and simultaneous outputs are provided, including serial data (RS-232 or RS-485, by model), analog (0-10 VDC and 4-20 mA) and switches (configurable as sinking or sourcing). Up to 32 RS-485 models can used in a multi-drop addressable network using the Modbus protocol – a standard feature. ToughSonic CHEM sensors offer the configuration and operational flexibility that all Senix sensors provide. Powerful extended features can be configured using SenixVIEW software. ToughSonic General Purpose sensors can also be used in liquid level applications where chemical resistance is not required. ■