New milling research investment kicks off

Three new milling-related research project have begun in 2016, as part of the most recent round of investment announced by Sugar Research Australia earlier this year.

Online analysis systems to measure the available nutrients in mill mud

Rapid measurement techniques to quantify the nutrients in mill mud/ash are a key factor in maintaining its availability as a nutrient source and soil ameliorant in an increasingly regulated environment. Legislation and best management practice (BMP) guidelines around agronomic inputs focus on quantifying and recording nutrient inputs, with the aim of optimising productivity and minimising environmental losses.

While these guidelines are effective for synthetic fertilisers, they penalise the use of milling by-products as a nutrient source, as their nutrient loading, chemical composition and biological availability are highly variable and difficult to quantify. This has also contributed to challenges in developing a beneficial use approval (BUA) for the products.

This project seeks to develop online NIR spectroscopic systems to analyse the availability of key nutrients in mill mud and ash mixtures as it leaves the factory. Project lead: Ms Eloise Keeffe, SRA, (07) 3331 3351.

A boiler simulator for improved operator training

Continuous, efficient and safe operation of a sugar factory depends on having competent and confident operators who can prioritise their requirements and react under pressure. Most operators have another role during the maintenance season and there is anecdotal evidence from factories that issues arising from operator error are more common early in the crushing season when operators are getting back up to speed.

Recent incidents have cost factories several million dollars in boiler repair costs and lost production, and have been attributed in part to operator error. These incidents have highlighted the importance of having boiler operators that can deal effectively with the many issues that can arise.

In some other industries simulation packages are an integral part of operator training, maintenance of skill levels and assessment of competence. If the sugar industry lags behind in this area it is likely that such incidents will continue to occur. The importance of this issue has been raised by the People and Safety Committee of the ASMC. This project is supported by the committee.

A training simulator consists of a front end, the interface that the user interacts with, and a back end that carries out the calculations. The front end receives input from the user which is sent to the back end. After performing the calculations, results are sent from the back end to the front end which displays the results in a suitable format.

This project involves the development of both back end and front end components of a boiler simulator and the interfacing of the two components into an integrated generic simulator for boiler operators. Project lead: Dr Anthony Mann, QUT, (07) 3138 1333.

Reducing boiler maintenance costs and deferring capital expenditure through improved technology

Boiler tube wear and corrosion costs the industry an estimated $5 million a year in repairs, stops and inefficient operation.

Given that most boilers in the industry are more than 30 years old and that the high capital cost of new boilers will result in very few replacements, nearly all existing boilers will operate into the foreseeable future.

As these boilers age, the wear and corrosion costs are likely to increase.

Tube coatings have been successfully applied in other industries and are expected to be equally beneficial to sugar mill boilers.

The application of tube coatings is expected to replace tube shields and significantly reduce wear and corrosion of boiler tubes in convention banks, air heaters and economisers.

The coatings will also be able to be used in currently mostly unprotected areas such as the super-heater loops.

This project aims to reduce boiler maintenance costs and defer capital expenditure through improved technology by identifying better and more practical coatings.

Project lead: Dr Floren Plaza, (07) 3138 1239.