AUSTRALIAN NEW SPEAKERS' RUN OFF COMPETITION
BIOPRIA, MONASH UNIVERSITY

Come along and support our New Speakers!

Proudly sponsored by

The **Appita New Speakers Run-off Competition** will be held at **BioPRIA on the Wednesday 18 September 2019, 9:00 am - 1:00 pm.** This year we have six young professionals who will compete for the right to represent Australia at the 2019 Fibre Value Chain conference, 10 – 12 December at the Melbourne Convention & Exhibition Centre.

Take the opportunity to catch up with industry friends and colleagues, whilst supporting our young professionals. This is an important event for them and would love to see you there.

CLICK HERE TO REGISTER or for this FREE event.
For further information please contact admin@appita.com.

OUR SPEAKERS

Madeleine Neville – Visy Industries
'Boiler Biogas Integration at Visy Paper 3 & 6'

The Wastewater Treatment Plant at Visy Paper 3&6 (VP3&6) produces biogas from the paper mill effluent. The biogas is created in the ICR (Internal Circulation Reactor) which is an anaerobic digester. The biogas is then fed to the THIOPAQ scrubber where it is biologically treated to reduce the hydrogen sulphide (H2S) concentration from 10,000ppm to 300ppm. Biogas is buffered in a 20m3 gas bag before it is fed by batch to an enclosed flare.

In 2017, VP3&6 installed two gas fired Maxitherm Boilers which are capable of operating using a mixed fuel source of natural gas and biogas. This presented an opportunity for the site to productively use the biogas generated by the ICR to reduce the cost of natural gas. In the new system, biogas is extracted from the gas bag and compressed with a blower. This biogas is passed through a lead/lag fixed bed scrubbing system before being fed to one of the packaged boilers. The hydrogen sulphide content of the biogas is reduced to below 10ppm prior to the boiler to ensure that the biogas does not contribute to corrosion in the boiler.

Since start-up of the biogas system at the end of December 2019, the savings in natural gas have amounted to $240,000.

Shawn Chen – Australian Paper
'Debottlenecking a Horizonal Belt Style Washer'

At Australian Paper's Maryvale Mill, the Chemiwasher is a horizontal style belt washer which is used to wash Unbleached Pine Kraft, produced at the Batch digesters. Currently the Chemiwasher production rate is limited 600 ADtpd by flooding, which is a problem caused by insufficient drainage of wash filtrate through the pulp pad. The aim of this investigation was to identify ways to remove this process bottleneck in order to increase the production rate of the Chemiwasher. Analysis into the filtrate balance around the Chemiwasher identified that this flooding was caused by insufficient filtrate removal from the Chemiwasher's formation zone. In order to overcome this limitation, trials were conducted involving diverting a side stream of wash filtrate from the second washing stage into the spill system. This filtrate removal acts to reduce the hydraulic limitation in the first and second washing stages, allowing the Chemiwasher to be run at higher rates, and with more stability. Trialling these changes yielded positive results, as the Chemiwasher was able to achieve 650 ADtpd before running into process bottlenecks upstream of the Chemiwasher. Pulp quality also showed improvement due to more efficient washing, as indicated by the 5th stage filtrate conductivity. The results from these trials justified capital expenditure to implement a permanent filtrate diversion system in the next Batch Mill Major shut.

Rudrashish (Rudra) Bandyopadhyay – Australian Paper
'Paper Machine 2 Saveall Improvement and Optimization'

As part of its back-water system, Paper Machine 2 at Maryvale Mill has a Sven Pedersen Floatation Saveall whose design was set up in the early 1930s. The Saveall makes use of compressed air, a high molecular weight long chain polymer (flocculant) and wooden paddles with a rubber coating to skim the fines which float to the to the top via a continuous scraping mechanism.

It is currently at 85% of its operational capacity and produces clarified water which is reused all over the paper machine. Laboratory tests have been conducted to measure the Saveall efficiency based on suspended solids removal and turbidity for different grades. For waste grades its efficiency has been significantly improved by reducing its throughput and with the help of a newly enhanced polymer dosing system.

Trials have been conducted on unbleached grades where we put the recovered fibre (mainly fines) back into our machine in order to reduce fibre loss which resulted in slight improvement in strength properties of the paper such as TEA, tensile strength and tear. When the Saveall is turned off or bypassed, water usage and effluent flow increases drastically causing additional expenses being incurred by the mill. Currently the paddle design in terms of material of construction to optimise the skimming process and quality of clarified water produced is being investigated.

Rachael Green – Australian Paper
'M2 Pressing Concerns'

Due to increasing machine demand, a project was developed to maximize the operating efficiency of the M2 paper machine first press section. A nip load curve needed to be determined to understand the current operating conditions and the limitations in construction. Initial assumptions provided a load curve to match expectations and roll crowns. However, over time operating conditions have changed and the resulting load curve needed to be recalculated with actual figures obtained during shutdown. For further understanding of the operating conditions deflection calculations were completed on the granite press roll. Due to age and construction, there is no simple calculation for the deflection of the suction roll and in order to obtain the relevant information an experimental method was established. Following extrapolation of results a full understanding of the actual operating set up is known. The limitations are recognized as the airbags and the construction materials of both the granite press roll and the suction roll. Future works will replace the press roll with a ceramic roll which will eliminate one limitation and allow the 1st press to operate at a higher nip load.

Steven Prokopiwskyi – Australian Paper
'Linerboard paper machine forming table optimization'

After a major wet end rebuild in August 2018 which included the commissioning of a modern headbox, new fan pump, a motorised forming board box, two new smart hydrofoil drainage boxes as well as a forming table extension, one of the major focuses on Maryvale's No.4 Linerboard Paper Machine has been the optimization of the multitude of new operating parameters and degrees of freedom that this new equipment has afforded us. The primary objectives of the optimization work were to increase drainage, improve formation and improve ring crush.

The new headbox came equip with an adjustable horizontal slice (slice setback) position, a degree of freedom which had previously been lacking with the old headbox. This allows precise control of the jet impingement angle on the wire, which has important implications for initial drainage and sheet formation.

The new motorised forming board box then allows for easy and precise control over the jet landing position across the entire grade range of the paper machine, something that was previously handled as a one size fits all parameter before the wet end upgrade due to the difficulty and impractically of adjusting the forming board box position manually every grade

change. This has important implications for initial drainage and fines retention.

The two new hydrofoil boxes immediately following the forming board box have motorised angle-adjustable drainage blades and height-adjustable activity blades, allowing for greater control of activity and drainage across these boxes across the significant basis weight range of the paper machine, which has important implications for sheet formation.

Since drainage was a major focus point of the project, the machine's low and high wire vacuum drainage systems were also examined in great detail as part of the overall drainage improvements.
The methodology used in the optimization process was a series of both short, medium- and long-term trials involving the adjustment of the operating parameters described above combined with observation of the changes these adjustments caused to drainage, formation and Ring Crush KPI's.
The results of the trials showed that significant improvements in drainage and formation were achieved, allowing the machine both to speed up (since drainage capacity is the primary bottleneck preventing machine speed increase the vast majority of the time) and to reduce steam consumption due to an increase in sheet dryness over the couch roll, which combine to increase the profitability of the machine significantly.

Lahiru Perera – Australian Paper
' Urea dosing optimization in nutrient deficient pulp & paper wastewater'

Australian Paper (AP) Wastewater Treatment Plant (WTTP) prides itself on the efficient treatment of its wastewater for compliance with EPA water quality discharge limits to the Latrobe River. Plant comprises two primary clarifiers, an extended aeration pond, a secondary clarifier and a polishing pond. Nitrogen, as ammonia, is a critical nutrient in biological wastewater treatment. Bacteria use it to make proteins, including enzymes needed to break down Biological Oxygen Demand (BOD). Initially, AP relied on two online nutrient meters for nutrient dosing. Online meters were prone to frequent heavy fouling due to their location and poor design. Since the complete failure of the online meters, the production team has manually adjusted the dosing rate based on lab data with low success. Preliminary studies showed an opportunity to reduce variation in residual ammonia concentrations to meet the aim of 0.25-1 mg/L at the exit of the aeration pond. Project followed the DMAIC (Define, Measure, Analyze, Improve and Control) methodology, a data-driven improvement cycle that measured and analyzed variation in residual nutrient levels from key pulp and paper effluent streams. Implementation stage showed that a non-capital, load-based model has the potential meet compliance and reduce significant variation. Results showed an increase in the percentage of daily lab tested residual ammonia levels meeting the target control limits increase from 32% (2012-2018) to 52% (2019-Jun-2019). Future studies will aim to identify limitations of the model and other inhibitory factors that adversely affect the nitrogen cycle in the aeration pond.
Take the opportunity to catch up with industry friends and colleagues, whilst supporting our young professionals. This is an important event for them, so would love to see you there.