

### Pulp Mill & Recovery Production Optimisation

Analysis of a pulp & paper mills operation over a 2-week period showed a potential increase in output that could be achieved by using **Pro-Plan** on a daily basis.

The **Pro-Plan** Pulp Mill and Recovery Optimisation System is an optimisation system that uses simulation and in-built decision making rules to determine the best operating strategy for any given situation. It is demand driven, and will maximize production consistent with any constraints in force at the time. It takes a global view of the mill to ensure that the recommended strategy is the best overall result for the mill as whole, as opposed to maximizing benefit for any one area. The result is better coordination of the whole mill.

During the period analysed, the main constraint was white liquor supply. However, **Pro-Plan** also handles other constraints such as:

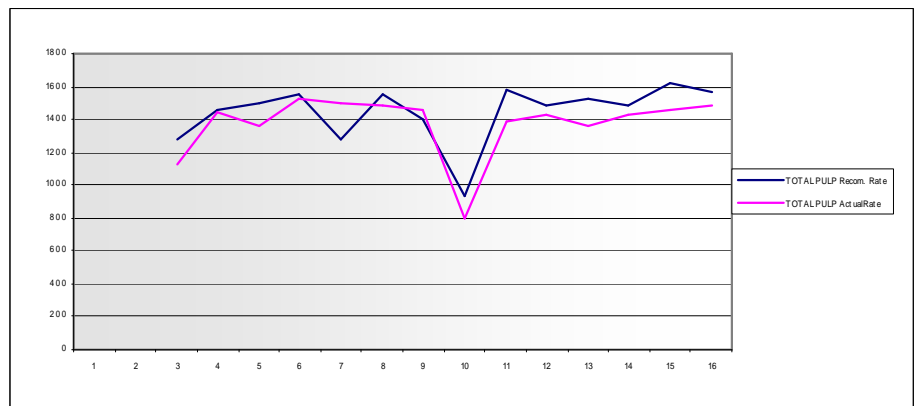
- production unit throughput of washers, evaporators and recovery boilers,
- equipment shutdowns
- steam limitations

The overall results of the study indicated a potential increase in pulp production over the two-week period of 67.9 ADT/D or 5%.

Another important benefit is the improved stability of operations in that production rate and storage level changes are minimized.

### Business Drivers for Pulp Mills

- Better knowledge of forecast pulp demand allowing stock to be built in preparation
- Business rules/strategies agreed by all departments
- Increased output
- Optimisation of washer dilution factors
- Less variability in pulp quality for washing and bleaching
- Lower inventories required



### Business Drivers for Steam/Recovery

- Maximising throughput by better management of bottlenecks as they change location
- More stable operation of evaporators and recovery boilers
- More stable clarifier levels leading to more stable white liquor quality
- Better scheduling of evaporator washes
- Business rules/strategies agreed by all departments
- Better knowledge of forecast steam demand
- Better allocation of boiler loading

### Business Drivers for Total Mill

- Better coordination leading to optimal economic result for total mill, instead of individual departments maximizing their own production to the detriment of others
- Better planning of shutdowns knowing the consequences for all areas

### Quantified Benefits

The increase in the total pulp output production over the 2 week period was 67.9 ADT/D.

In addition to the economic value of increased output, there are other operational and quantity benefits that would result from more stable operation. Less variability in pulp quality should result from fewer and smaller production rate changes. This will stabilise continuous digesters, washers and bleach plant operation. The gains here could be substantial - both on equipment wear and pulp quality consistency.

Better planning and prediction will allow lower pulp inventories. For example, lowering the level of pulp on the slab will reduce the amount of double handling and energy required to press pulp, dump it on the slab and reclaim it.

The study has shown that **Pro-Plan** can maximize production against constraints. The aim is to take maximum benefit from any situation as soon as possible, before that "window of opportunity" disappears, e.g. a breakdown occurs, or some other constraint dominates.

### Return on Investment

The likely ROI is calculated based on the benefits and system costs. Therefore ROI would be 3500%, or payback in 10 days. These figures are based on certain assumptions which are noted in the detailed report. However, it is obvious that significant increases in production can be realised.

As well as the economic benefits due to production increases, the use of **Pro-Plan** will result in greater stability of operation.

In summary, **Pro-Plan** is a management tool which will:

- maximize production
- Stabilize production
- Reduce the time needed for mill planning and coordination
- Standardize decision-making.