

ANOTHER MITEK ADVANTAGE

INVESTING IN MACHINERY UPGRADES

Replacing or adding major pieces of truss manufacturing equipment is often considered as a way to reduce a plant's bottleneck and increase its overall production output. Smaller scale upgrades to existing equipment are an alternative way of increasing profits, often with a lower capital outlay and less risk.

Using the EqA system of production cost management the following example demonstrates how a modest investment in a machinery upgrade can reduce a plant's cost/EqA and raise profits significantly.

Consider a medium size plant that produces an average 280 EqA per day. It has two flow-through jigs each producing 120EqA per day, plus a jack-press station making the remaining 40EqA.

The production manager 'Phil' identifies the main jigs as his plant bottleneck and does a timed production study to find inefficiencies. He observes the press operator waiting for the extension and retraction cycles of the hydraulic

By **CAMERON WAKE**
Machinery Support Engineer
MiTek Australia Limited

	Before	After
Plant Capacity EqA / Day	300	305
Days per Month	20.0	20.0
Current Truss Output EqA / Day	280	285
Total Operating Cost / Month (\$)		
- Fixed	43,372	43,505
- Variable	33,529	33,632
- Total	76,901	77,137
Cost / EqA (\$)	13.73	13.53
Market Rate / EqA (\$)	15.00	15.00
Profit / EqA (\$)	1.27	1.47
Profit / Month (\$) (20 days)	7,112	8,379

press head, 'inching' the controls so as not to crush the timber (because the hydraulic pressure setting is not properly adjusted), and losing time moving his hands between the 'down' and 'up' control buttons.

He takes some measurements and finds the average pressing cycle time is 4.5 seconds. With a little investigation he discovers that the hydraulic cycle time can be reduced by 1.5 seconds by fitting a 'regenerative valve' for faster cylinder extension, and delays at the bottom of the press stroke eliminated with an automated return cycle (whilst retaining a two button hold-to-run system for safety).

The retrofitted equipment will cost \$4000 per press and Phil knows that a minute saved in the pressing cycle is minute available for extra production, but given the capital expense will there be a significant net benefit to the plant's bottom line?

Phil determines from recent jobs that the 120EqA per jig comprises approximately 55 trusses and therefore an average of

385 joints per shift. Since the total time saved per cycle is 1.5 seconds, the time saved per shift is $1.5 \times 385 / 60 = 9.6$ minutes per jig. Plant-wide this extra production time creates an additional 5EqA per shift, or 100EqA for a 20 working day month.

Using Profit Centre, the plant's production cost management software package, he determines that the investment in the new equipment will add \$133 /month in fixed costs (\$8000 depreciated over 5 years). Profit Centre automatically adds \$103 /month to variable costs for the additional plant output.

Reviewing the results (refer to the summary report), it is clear that the proposal has merit. At the new production rate of 285EqA per shift, the plant's cost/EqA has dropped by 20 cents. This equates to over \$1250 /month additional profit!

Phil is also pleased that the proposal doesn't require any procedural or staff changes, is not likely to encounter resistance from operators, and its implementation will cause minimal interference to his production schedule.

Whilst this example only applies to bottleneck presses, the universal points to be noted are:

A timed production study of the bottleneck can identify key areas for efficiency gains.

Pressing equipment upgrades are a direct vehicle to improved productivity and reduced cost/EqA.

Using the EqA system of production cost management and its associated software makes the cost-benefit analysis fast & straightforward for small or large machinery upgrade proposals.

I encourage production managers to review the efficiency of their truss plant machinery and utilise their EqA cost management software for cost-benefit analysis of proposed equipment upgrades.

Cost Benefit Analysis - Faster Cycle on Flow Thru Jig Presses

Calculate Production Gain

- 120 EqA per jig per 7hr shift. & 55 Trusses per shift
- Avg 7 joints per truss, : 385 presses per shift
- Saving of 1.5 sec per joint = 9.6 minutes extra production
- Extra 5.6 EqA per shift or 100 EqA per month

Calculate Cost

- \$8,000 capital outlay for modifications to 2 presses
- \$133pm extra fixed overhead (depreciated over 5 years)
- \$102pm extra variable overhead for extra output
- Add \$236pm to existing \$77,000pm overhead

Calculate Profit & Payback using Profit Centre

- Old \$/EqA = \$13.73, New \$/EqA = \$13.53
- Saving of 20 cents per EqA plantwide
- Additional profit per month is over \$1,250!
- Payback period is less than 7 months.