5. ASSESSMENT RECOMMENDATIONS

AR No. 1

Automate Final Sorting Line

Recommended Action

Manually sorting lumber is labor intensive and has high potential risk for injuries. Automated sorting equipment can reduce the amount of labor needed in this area, as well as minimize the potential risk for injury.

Assessment Recommendation Summary			
Energy (10^6 Btu)	Cost Savings	Implementation Cost	Payback (years)
206	$265,366	$900,000	3.4

Background

A crew of 5 workers per shift currently sorts and stacks cut green lumber by length onto separate carts. Most new workers start in this sorting area and are typically unskilled, which results in high potential for injury. Although most injuries are minor hand or leg trauma (bumps and bruises), the repetitive motion of the workers in this area can lead to chronic back pain.

Anticipated Savings

Automated sorting equipment will minimize the amount of manual labor needed for sorting. This measure will reduce the risk of injuries associated with the sorting and stacking of lumber. However your injury records do not reveal that this area is a significant contributor of claims for workers compensation. Therefore savings associated with injury reduction will not be claimed.

Primary cost savings will come from a reduction in labor required to sort and stack lumber. The mill employees currently work a total of 4,016 hr/yr split between 2 shifts (excluding unpaid breaks). Each shift dedicates 5 employees earning an average burdened wage (BW) of $17.70 to the task of sorting and stacking. Automation will reduce the number of workers (WR) needed in the sorting area by 4 per shift. We anticipate that 1 employee will be needed each shift to monitor the sorting area. Labor savings (LS) will be:

LS = WR x OH x BW
= 4 workers/shift x 2 shifts 2,008 hr/shift-yr x $17.70/hr
= $284,300/yr

The automated sorter will be installed in place of the current sorting equipment arrangement. The proposed equipment will use hydraulic systems for moving parts. We anticipate the total pump power required by the system will be 20 hp. Electrical demand (PD) and energy (PE) requirements for the pumps is estimated as:

PD = 20 hp x 0.746 kW/hp
= 15 kW

PE = PD x OH
= 15 kW x 4,016 hr/yr
= 60,240 kWh

Electric utility increases, based on current demand rates of $3.15/kW-mo and energy rates of $0.03100/kWh, will be:

$PD = 15 kW x $3.15/kW-mo x 12 months
= $567

$PE = 60,240 kWh x $0.03100/kWh
= $1,867

Other annual operating and maintenance costs for the system are estimated to be 2.5% of the equipment cost of $650,000, which is $16,500. Savings and operating costs are summarized in the following table.

Savings Summary

Source	Quantity	Units	10^6 Btu	Cost $
Labor				$284,300
Electrical Demand	-15	kW		-$567
Electrical Energy	-60,240	kWh	206	-$1,867
Other O&M				-$16,500
Total				$265,366

Implementation Cost

A vendor quoted the installed cost of automated sorting equipment to be $650,000. Installation will require temporary reorganization of the sorting line to avoid production interruptions. Remodeling work on the current building to house the new system may

also be required. We estimate installation costs to be approximately $250,000. Installation cost includes the cost for temporary line alterations, vendor support and employee training. The following table summarizes the total cost of this recommendation.

Implementation Cost Summary	
Source	Cost $
Equipment Cost	$650,000
Installation Costs	$250,000
Total	$900,000

Savings will pay for implementation in 3.4 years.