National cranberry cooperative

National Cranberry Cooperative In early 1981, at the National Cranberry Cooperative’s receiving plant number 1 (RP1), overtime costs are too high and delivery trucks and their drivers have to wait several hours to unload. The trucks have to wait because the plant’s holding bins fill up and there is not temporary storage. The holding bins fill up because within the cranberry operating system there is a bottleneck, a place in the production process where production slows down because of a slow or insufficient number of machines. This bottleneck is being caused by the lower relative capacity of the dryers. Relieving the bottleneck in the dryers by adding more dryers will allow the trucks to move through the dumping area more efficiently and decrease overtime costs in 1981.

The three dryers individually process 200 barrels per hour, for a total of 600 barrels per hour. This is much less than the other processes in the plant. (see exhibit 2) •Dry holding bins 1-16 store 250 barrels each, making dry bin capacity 4000 barrels per hour. •Wet/dry holding bins 17-24 store 250 barrels each and wet bins 25-27 hold 400 barrels each.

Since only 30% of the cranberries forecasted for 1981 will be dry, and the dry bins hold more than 30% of the bin capacity, all of the wet/dry bins should be dedicated to the wet cranberries. Therefore, total wet bin capacity is 3200 barrels per hour. •The destoners capacity is 4500 barrels per hour. •The dechaffers capacity is also 4500 barrels per hour •The separators capacity is 1200 barrels per hour. To relieve the bottleneck, the cranberries need to spend less time in the dryers than they do in any other part of the process. The next longest process is the separating process.

Assume that, according to exhibit 1 in the National Cranberry Cooperative (Abridged) case, RP1 receives approximately 18, 000 barrels of cranberries a day. (see exhibit 3) •The cranberries spend 15 hours in the separator. To speed the drying process, RP1 should buy two more dryers. These two dryers will raise the dryer capacity to 1000 barrels per hour. Adding the dryers will lower the time the cranberries spend in the dryers enough to relieve the bottleneck. see exhibit 3) •At 12, 600 (70% of 18, 000) wet barrels per day, the cranberries currently spend 21 hours a day in the dryers.

•Adding one dryer lowers the time in the dryers to 15. 75 hours a day. •Adding two dryers lowers the time in the dryers to 12. 6 hours a day. Spending 12.

6 hours in the dryers relieves the dryer bottleneck and the separator becomes the bottleneck. Long-term, RP1 should begin to look at how to relieve this next bottleneck. The time spent waiting for the holding bins to empty causes extra overtime. Simply adding in two new dryers will decrease this overtime.

The 21 hours currently spent in the dryers will be decreased to 12. 6 hours. However, the slowest process will then be the separator at 15 barrels per hour, so the throughput time is cut by (21-15= 6) six hours. This results in an average of six overtime hours saved daily.

Currently, there is no need to add holding bins. While the bottleneck is still located in the dryers, adding capacity in the holding bins will only cause the cranberries to wait in the bins longer and will not improve throughput time. Purchasing two new dryers for the National Cranberry Cooperative’s

receiving plant number 1 will reduce the wait time for trucks by speeding up the overall process. The quicker process will result in a reduction of overtime hours.

The two new dryers will cost RF1 $40, 000 each, for a total of $80, 000. Saving six hours a day in overtime will reduce the yearly overtime by 18% (6 hours a day*7 days a week*52 weeks a year = 2, 184 hours), saving the plant $21, 300 per year in overtime costs. The dryers can pay for themselves in four years.