7-32 (30 min.) Cost allocation, downward demand spiral

SOLUTION EXHIBIT 7-32

<table>
<thead>
<tr>
<th></th>
<th>2014 Master Budget</th>
<th>Practical Capacity</th>
<th>2015 Master Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>Budgeted fixed costs</td>
<td>A$1 520 000</td>
<td>A$1 520 000</td>
<td>A$1 520 000</td>
</tr>
<tr>
<td>Denominator level</td>
<td>975 000</td>
<td>1 300 000</td>
<td>780 000</td>
</tr>
<tr>
<td>Budgeted fixed cost per meal</td>
<td></td>
<td>A$ 1.56</td>
<td>A$ 1.17</td>
</tr>
<tr>
<td>Budgeted fixed costs ÷ Denominator level</td>
<td>(A$1 520 000 ÷ 975 000; A$1 520 000 ÷ 1 300 000; A$1 520 000 ÷ 780 000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budgeted variable cost per meal</td>
<td>4.80</td>
<td>4.80</td>
<td>4.80</td>
</tr>
<tr>
<td>Total budgeted cost per meal</td>
<td>A$ 6.36</td>
<td>A$ 5.97</td>
<td>A$ 6.75</td>
</tr>
</tbody>
</table>

1. The 2014 budgeted fixed costs are A$1 520 000. Freshfoods budgets for 975 000 meals in 2014, and this is used as the denominator level to calculate the fixed cost per meal. A$1 520 000 ÷ 975 000 = A$1.56 fixed cost per meal. (see column (1) in Solution Exhibit 7-32).

2. In 2015, 3 Nursing homes have dropped out of the purchasing group and the master budget is 780 000 meals. If this is used as the denominator level, fixed cost per meal = A$1 520 000 ÷ 780 000 = A$1.95 per meal, and the total budgeted cost per meal would be A$6.85 (see column (3) in Solution Exhibit 7-32). If the Nursing homes have already been complaining about quality and cost and are allowed to purchase from outside, they will not accept this higher price. More Nursing homes may begin to purchase meals from outside the system, leading to a downward demand spiral, possibly putting Freshfoods out of business.

3. The basic problem is that Freshfoods has excess capacity and the associated excess fixed costs. If Ahrens uses the practical capacity of 1 300 000 meals as the denominator level, the fixed cost per meal will be A$1.17 (see column (2) in Solution Exhibit 7-32), and the total budgeted cost per meal would be A$6.07, probably a more acceptable price to the customers (it may even draw back the three Nursing homes that have chosen to buy outside). This denominator level will also isolate the cost of unused capacity and not allocate it to the meals produced. To make the A$5.97 price per meal profitable in the long run, Ahrens will have to find ways to either use the extra capacity or reduce Freshfoods’s practical capacity and the related fixed costs.

7-33 (20 min.) Cost allocation, responsibility accounting, ethics (continuation of 7-32)

1. (See Solution Exhibit 7-32). If Freshfoods uses the rate based on its master budget capacity utilisation to allocate fixed costs in 2015, it would allocate 760 500 × A$1.95 = A$1 482 975. Budgeted fixed costs are A$1 520 000. Therefore, the production volume variance = A$1 520 000 – A$1 482 795 = A$37 025 U. An unfavourable production volume variance will reduce operating income by this amount. (Note: in this business, there are no inventories. All variances are written off to cost of goods sold).

2. Nursing Homes are charged a budgeted variable cost rate and allocated budgeted fixed
costs. By overestimating budgeted meal counts, the denominator-level is larger, hence the amount charged to individual Nursing homes is lower. Consider 2015 where the budgeted fixed cost rate is computed as follows:

A$1 520 000/780 000 meals = A$1.95 per meal

If in fact, the Nursing home administrators had better estimated and revealed their true demand (say 760 500 meals), the allocated fixed cost per meal would have been

A$1 520 000/760 500 meals = A$2.00 per meal, 2.6% higher than the A$1.95 per meal.

Hence, by deliberately overstating budgeted meal count, Nursing homes are able to reduce the price charged by Freshfoods for each meal. In this scheme, Freshfoods bears the downside risk of demand overestimates.

3. Evidence that could be collected includes:

a. Budgeted meal-count estimates and actual meal-count figures each year for each Nursing home controller. Over an extended time period, there should be a sizable number of both underestimates and overestimates. Management accountants could be ranked on both their percentage of overestimation and the frequency of their overestimation.

b. Look at the underlying demand estimates by patients at individual Nursing homes. Each Nursing home controller has other factors (such as hiring of nurses) that give insight into their expectations of future meal-count demands. If these factors are inconsistent with the meal-count demand figures provided to the central food-catering facility, explanations should be sought.

4. a. Highlight the importance of a corporate culture of honesty and openness. Orchid Homes Ltd could institute a Code of Ethics that highlights the upside of individual Nursing homes providing honest estimates of demand (and the penalties for those who do not).

b. Have individual Nursing homes contract in advance for their budgeted meal count. Unused amounts would be charged to each Nursing home at the end of the accounting period. This approach puts a penalty on Nursing home administrators who overestimate demand.

c. Use an incentive scheme that has an explicit component for meal-count forecasting accuracy. Each meal-count ‘forecasting error’ would reduce the bonus by A$0.05. Thus, if a Nursing home bids for 292 000 meals and actually uses 200 000 meals, its bonus would be reduced by A$0.05 × (292 000 – 200 000) = A$4600.
7-35 (30 min.) Target pricing, target cost and value engineering

1. Direct materials \( A$14.98 \)
   Direct manufacturing labour (\( A$15 \) per hr. \( \times \) 0.5 hr.) \( 7.50 \)
   Engineering \( \left( \frac{A$14 \times 25000 \text{ hrs.}}{50000 \text{ units}} \right) \) \( 7.00 \)
   Testing (\( A$12 \) per hr. \( \times 0.25 \) hr.) \( 3.00 \)
   Full cost per unit of G16 \( A$32.48 \)

2. Mark-up % = \( \frac{A$40.60 - A$32.48}{A$32.48} \) = 25%

3. These new units will require direct costs and testing, but no additional engineering since there will be no incremental R&D and design costs to produce 10 000 more units.

   Incremental revenues \( A$40.60 \)
   Direct costs (\( A$14.98 + A$7.50 \)) \( 22.48 \)
   Testing costs \( 3.00 \)
   Contribution margin \( A$15.12 \)
   Increase in units sold \( \times 10000 \) units
   Increased contribution margin \( A$151200 \)
   Less : Advertising costs \( 200000 \)
   Operating profit (loss) \( A$(48800) \)

4. Direct costs (\( A$22.48 \times 60 000 \) units) \( A$1348800 \)
   Engineering (\( A$14 \times 25000 \) hrs.) \( 350000 \)
   Testing (\( A$3 \times 60000 \) units) \( 180000 \)
   Marketing \( 200000 \)
   Full cost of G16 \( A$2078800 \)
   Divide by number of units \( \div 60000 \) units
   Full cost per unit of G16 \( A$34.65 \)
   Mark-up \( \times 1.25 \)
   New selling price \( A$43.31 \)

(The increase in units sold is insufficient to cover the extra advertising costs and incremental costs of production. Systematic will incur an operating loss on these extra units and should not pursue this strategy.)
7-36 (30 min.) Value engineering, target pricing and locked-in costs

1. Design cost A$ 5 000
   Direct materials 120 000
   Direct manufacturing labour 142 000
   Variable manufacturing overhead 64 000
   Fixed manufacturing overhead 46 500
   Marketing 15 000
   Total cost A$ 392 500
   Cost per unit (A$392 500 ÷ 200) A$ 1 962.50
   Target cost per unit (A$2 000 × 0.90) A$1 800.00

   The cost estimate developed by Hoover does not meet Pacific’s requirements. Value engineering will be needed to reduce the cost per unit to the target cost.

2. Total costs (requirement 1) A$ 392 500
   Less: Reduction in material costs (A$120 000 × 40%) 48 000
   Add: Increase in design costs 6 000
   Total costs of redesigned table A$ 350 500
   Revised cost per unit (A$350 500 ÷ 200 tables) A$1 752.50
   Revised target cost per unit (A$1 950 × 0.90) A$1 755.00

   The design change allows the table to meet Pacific’s requirements for target costing. The cost of materials is a locked-in cost once the design is finalized.

3. Revised total cost (A$392 500 + A$7 000) A$ 399 500
   Revised cost per unit (A$399 500 ÷ 200) A$1 997.50
   Revised target cost per unit (A$2 200 × 0.90) A$1 980.00

   No this proposal does not allow the table to meet Pacific’s requirements for target costing.

4. Requirement 2 Requirement 3
   Revenue (A$1 950 × 200; A$2 200 × 200) A$390 000 A$440 000
   Total costs 350 500 399 500
   Operating income A$ 39 500 A$ 40 500

Even without value engineering Pacific Decor should implement the actions in requirement 3. It should spend A$7000 on marketing if it can achieve a higher price of A$2200 even though it does not achieve the target cost because it earns a higher overall operating income. Doing value engineering will help it increase operating income even more relative to requirement 2.
Part (d) In terms of solutions, students will raise many issues in this discussion. Ultimately students’ discussion should centre on the fact that each organisation would need to look at their products and determine whether or not activities were perceived as value-adding by the majority of their customers.

Part (e) There is no definitive answer to this activity. The aim is to get students to look beyond manufacturing when applying the concept of value-adding. In each case they need to consider that there are certain activities that have to be undertaken in each scenario. However, when designing how a task is being undertaken, it is possible there are non-value-adding activities that can be eliminated.