

OPERATIONAL CASE STUDY NOVEMBER 2016 EXAM ANSWERS

Variant 1

The November 2016 exam can be viewed at

<https://connect.cimaglobal.com/resources/november-2016-operational-case-study-variant-1>

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SECTION 1

SOLAR WAFER SHORTAGE AND SELECTION OF NEW SUPPLIERS

Production scheduling based on profit - maximisation

We have a shortage of solar wafers which is limiting our production of solar cells. As the same number of solar wafers is used to produce each solar cell, we would want to make the best use of the solar cells as possible. Each of our products uses a different quantity of solar cells therefore we should maximise the contribution per solar cell and not the gross profit per unit as suggested by Volker. Our total fixed costs will not be affected in the short-term by the mix of products produced and therefore for short-term decisions such as these it is appropriate to focus on contribution per solar cell.

We can calculate the contribution per cell by dividing the contribution per panel by the number of solar cells used in each panel. We would then need to rank the products on the basis of the contribution per solar cell. The product with the highest contribution per solar cell would rank 1st and the product with the second highest contribution would rank 2nd and so on. We would then determine the production schedule based on this ranking.

This would give us a production schedule based on short-term profit maximisation. However the fact that there is a shortage of solar wafers will mean that we will leave the production requirement, and consequently demand, for at least one of our products unfulfilled. This may have implications for the longer term, which we would need to consider.

- 1) Andreas has suggested that 'Solar Halo' is going to be a market leader in the future. What effect would restricting the supply of 'Solar Halo' in the short term have in the longer term sales of the product? If we do not supply the full requirement of 'Solar Halo' it may give an opportunity for one of our competitors to take up some of our planned market share and affect our long term returns.

- 2) What effect would offering a reduced supply of one of our products have on customers who purchase the full range of our products? If we do not supply them with at least some of the four products, would they seek an alternative supplier for all their requirements? By failing to supply our customer requirements there may be a loss of customer goodwill. An alternative approach may be to prioritise our most important customers and then use the remaining resources based on the ranking given for short-term profit maximisation.

In conclusion therefore, rather than pursuing a short-term profit maximisation objective, we may be better to take a longer term view of the decision.

Factors to consider when selecting a supplier

An important consideration for the choice of future supplier is price, however we should not make a decision on which supplier to use based solely on price. The need for a new supplier arose as a result of a market shortage of wafers and we need to ensure continuity of future supplies. We therefore should consider a number of qualitative factors in relation to the supplier:

- a) Will the supplier be prepared to enter into a long-term contract to ensure continuity of supply? How regularly will the agreed price be revised?
- b) What credit terms will the supplier be prepared to offer?
- c) What production capacity does the supplier have available and what are its plans for further expansion of capacity? We want to ensure continuity of supply as our business grows.
- d) Does the supplier meet the quality standards we would expect from one of our suppliers? Our quality standards are of vital importance to us and it is therefore important that our suppliers are able to maintain these high standards.
- e) Where is the supplier located? A supplier that is located in Freeland or in a nearby country may be able to fulfil our orders more quickly. Supplies from an overseas supplier are subject to risk of delay due to weather or other external factors.
- f) How reliable is the supplier? Would the supplier be able to produce the quantities required at the right time? Delays in supply would result in us being unable to meet our customers' requirements and potentially a loss in customer goodwill and future business.
- g) Is the supplier financially secure? If the supplier failed we would be unable to meet customer demand until we could source a new supplier. We would need to review the potential suppliers' financial performance and track record in terms of reliability. We should also consider how well the supplier is managed.
- h) What is the culture of the supplier? Does the supplier have the same ethos as us with regard to environmental issues and sustainability? We should also consider the supplier's reputation in terms of corporate and social responsibility.

SECTION 2

WORKING CAPITAL CYCLE

Reducing the working capital cycle

The working capital cycle represents inventory days plus receivable days less payable days. The longer the working capital cycle, the longer capital is tied up and not earning a return. However businesses need sufficient working capital to survive and therefore working capital needs to be managed to balance these two requirements. There are a number of steps that could be taken to reduce the working capital cycle as follows:

Inventory

Our current inventory levels are high at F\$21 million. What is the breakdown of this between raw material, work in progress and finished goods?

We could reduce our raw material inventory holdings by reviewing slow moving stock, re-order levels and re-order quantities. In the longer term, we might also consider the use of JIT purchasing.

Better supplier relationships may also help to ensure the correct inventory is received at the right time and reduce the lead time between order and receipt of goods.

It must be borne in mind however that reducing inventory levels could result in the loss of discounts for bulk purchases and we may also incur additional costs as a result of price rises. There is also the danger of stock-outs which may result in production delays and failure to meet our customers' orders on time.

We could review our production techniques and efficiency levels with a view to reducing work in progress.

Our main production is of four standardised products. Do we need to hold such large inventories of these products? We could reduce our finished good inventory by reorganising our production scheduling and distribution methods. In the longer term, we could also consider the introduction of JIT production. We must however ensure that any changes do not affect our ability to satisfy customer demand and result in a reduction in sales.

Accounts payable

We could obtain more finance from suppliers by delaying payments. This is considered by some to be unethical and could result in the withdrawal of credit and / or future supplies. The Finance Director is concerned not to jeopardise supplier relations, we should therefore do this through negotiation with the supplier. We may however lose potential early settlement discounts or incur additional charges as a result of this policy.

Accounts receivable

Are our customers paying according to agreed credit terms or is there evidence of late payment? We could reduce the credit given to customers although this may result in a loss of sales. We could however ensure that we invoice customers and follow up outstanding amounts more quickly, without damaging customer relations. We could also offer early payment discounts to customers although we would need to evaluate whether the reduced cash payment would be outweighed by the benefit of receiving cash quicker.

Another alternative would be to factor our debts or use invoice discounting. This would generate immediate cash flow however there would also be interest costs and fees involved.

We would need to decide if these costs are justified compared to the benefits offered. We would also need to carefully consider whether factoring is appropriate since it may cause our customers to question our financial stability.

SECTION 3

CVP ANALYSIS

CVP / Sensitivity Analysis

Using the figures that you have calculated for our range of solar panels, we can calculate the break-even point and the margin of safety, if we assume that the sales mix is constant.

To do this we need firstly to calculate the contribution to sales ratio for each of the products by dividing the contribution per unit by the selling price. We can then calculate the weighted average contribution to sales ratio by weighting the contribution to sales ratio by the percentage sales revenue mix.

We can then divide the fixed costs by the weighted average contribution to sales ratio which will give us the break-even sales volume in F\$.

If we compare this figure to our budgeted sales we can calculate the margin of safety. This tells us by how much sales can fall before we make a loss. We can also express the margin of safety as a percentage by dividing the budgeted sales minus the breakeven sales by the budgeted sales.

We can also calculate the sales revenue required to make a required profit target by adding the required profit target to the fixed costs and dividing by the weighted average contribution to sales ratio.

We can also apply sensitivity analysis by changing the variables in the CVP model. We could change each of the variables, selling price per unit, variable cost per unit, sales mix ratios to assess the impact on profit and breakeven point.

Benefits / limitations of the analysis

The major benefit of CVP analysis is that it indicates the lowest amount of activity necessary before we make losses. It aids decision making as it explains the relationship between cost, volume and profit. It can be extended using 'what-if' or sensitivity analysis to explain how changes in the relationship between fixed and variable costs or in revenues will affect profit levels and break-even.

However, the analysis is fairly limited as we have assumed a constant sales mix which may not actually occur. It is also based on our assumptions about the behaviour of revenue, costs and volume. Other factors, beside volume will affect profits including, changes in selling price, unit costs of inputs and efficiency. We have assumed that all costs can be divided into fixed and variable elements and that fixed costs remain constant over the relevant range of the CVP analysis. We have also assumed that variable costs are directly proportional to volume over the relevant range.

Cash flow deficit

There are a number of steps that we could take to avoid the short-term cash deficit arising including:

- a) Approaching the bank to arrange additional short-term borrowings. This may be relatively straight forward as we have a good track record with the bank and they already hold security for the existing overdraft;
- b) If we currently hold any short-term investments we could sell these, although we would need to consider any penalties that may be imposed as a result of early withdrawal / sale;
- c) The main reason for the deficit is the purchase of the new machinery in January. Are we already committed to this purchase or can it be delayed until a later date? We need to be careful however that a deferral does not compromise our other plans. It may however be possible to arrange a loan or lease finance for the purchase;
- d) Is it necessary to make the dividend payment in February? Delaying the payment of the dividend until March would deal with the majority of the deficit in February leaving only the January deficit, which is significantly lower, to be dealt with;
- e) Postponing non-essential capital or revenue expenditure such as the additional advertising spend in February. We should be careful however as whilst advertising expenditure tends to be classified as discretionary expenditure a reduction or delay in the expenditure may result in reduced turnover at a later date. The same point could also be made about the R&D expenditure;
- f) Is it possible to bring forward the planned disposal of non-current assets? If the asset is not required we could sell the asset sooner or perhaps arrange with the purchaser to pay a deposit.

SECTION 4

SUPPLIER QUALITY ISSUES

Managing supplier relationships

We could in future use a relationship approach to managing our suppliers. Relationships could be formed to ensure our suppliers are performing well, in particular to ensure the quality of supply.

If we actively manage our relationship with suppliers we may be able to positively influence the price paid and negotiate discounts for swift payment, loyalty or bulk orders. However rather than emphasise price, we should build relationships with suppliers in order to jointly manage the entire supply chain better so that mutual benefits can accrue.

Strong relationships are also needed with our suppliers, in order to ensure a continuity of supply and goodwill. We should attempt to actively manage the relationship with our suppliers because we may need the supplier's cooperation when there are 'rush' orders or changes in purchasing requirements at short notice.

Relationships such as this are built on trust between the two parties but this is normally supported by a formal contractual agreement. A service level agreement would include details of expectations from each of the parties. In particular, we would want it to cover areas such as expected quality standard and delivery lead times. We would also need to give commitments to the suppliers in respect of minimum annual volumes and payment terms. Finally, we would need to specify the penalties that would be imposed for default by either party. Drawing up the agreement would involve input from our department and both Volker's and Samuel's departments. With such an agreement, both parties can plan for the long-term with confidence in future business and the way that business will be conducted.

In the longer term, we could introduce a total quality management (TQM) approach and work with our supplier to ensure that they do the same. This is especially important if we want to operate just in time (JIT) approaches.

TQM would give us a competitive edge in our dealings with suppliers and the drive towards continuous improvement would give us a more motivated and committed staff which can only lead to an improvement in supplier relations.

Other initiatives that could be considered include inspection of goods delivered and regular feedback to suppliers, selection of suppliers with a similar ethos to ours, involvement of suppliers in new product design and arranging regular visits to suppliers.

Actively managing our relationship with suppliers may allow us to gain a relative competitive advantage over rival firms which do not currently practice relational procurement and operations.

Quality cost reporting

Quality cost reporting would provide an important addition to our current management accounting information.

A cost of quality report would have directed our attention to the rise in quality costs as a result of the failure with the quality standards from the new supplier. The proposed quality report below shows the type of costs that we would include. Conformance costs are concerned with the costs of achieving quality standards, whilst non-conformance costs are

concerned with the consequences of failing to achieve these standards. Conformance costs are further divided into prevention costs (costs incurred to ensure that things do not go wrong) and appraisal costs (costs incurred to check for quality problems before they lead to failures). Non-conformance costs are also further divided into internal failure costs (where there has been a quality failure that has been detected and dealt with before the product has been delivered to the customer) and external failure costs (where the failure occurs after the goods have been delivered to the customer). The quality problems with Solar Systems would have arisen in the form of non-conformance costs as there was a quality failure. Quality cost reporting would have enabled us to take remedial action at an earlier stage.

The quality failure may have been avoided had we spent more on both prevention costs, for example, the initial evaluating of Solar System as a supplier and /or in appraisal costs, for example the inspection of the solar wafers when they were received in the warehouse. The conformance costs of quality whilst reducing profits can potentially avoid significant non-conformance costs at a later date.

If we use cost of quality reporting in the future it will enable us to identify potential areas for improvement which will lead to effective quality programmes and eventually improve overall organisational performance. This is particularly important for our organisation as our high quality standards are respected in the industry.

Cost of quality reporting will help to reduce operational costs thus enhancing our competitiveness through higher quality and lower costs.

The use of cost of quality data will also be helpful in the future evaluation of capital investment alternatives. It helps justify and steer investments in prevention activities, which lower quality costs. It also helps justify and steer other quality improvement efforts and investments. As it is the accounting department that is preparing the information the quality data is likely to be more readily accepted.

The cost of quality system will also enable us to develop more advanced performance measures in the areas of customer satisfaction, production and design.

Examples of quality costs

I have given some examples below of quality costs that would be relevant to our business.

Cost of conformance	Appraisal costs	<p>Cost of inspection of solar wafers when received into the warehouse – these costs would be expected to be higher for goods received from new suppliers and gradually reduce as confidence in quality standards are attained</p> <p>Cost of inspection of solar panels, to ensure the panels meet the required quality standards, before delivery to customers</p>
	Prevention costs	<p>Evaluation costs of a new supplier to ensure quality standards prior to supplier selection – this is an important stage in ensuring acceptable quality standards from a new supplier</p> <p>Cost of staff training in quality control procedures and processes to ensure our high quality standards are maintained</p>
Cost of non-conformance	Internal failure costs	<p>The cost of faulty panels which have failed to meet our quality control standard, that cannot be reworked including both labour and material costs</p> <p>The labour costs and cost of replacement parts involved in reworking faulty panels that have failed to meet our quality control standard</p>
	External failure costs	<p>The cost of processing customer complaints from customers who have received faulty panels</p> <p>The labour, material and delivery costs of replacing panels which have proved to be faulty either before or after installation but after delivery to customers</p>