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For your holiday reading

The Best of 'THE TROUBLESHOOTER'

This is the last issue for 2012. SAM now takes a two week break and will rejoin you in 2013. Thank you all for your enthusiasm for better asset management, for your suggestions, questions, emails and conversations.

Many of you will be taking time out from work, some will be working 'the graveyard shift' over the holiday season. Whichever group you fall into, I think you will find this compilation of anecdotes from the Troubleshooter's Casebook, originally published between 1998 and 2000, both entertaining and instructive. Here you will find innovative ideas for many problems that bedevil us all - from what to do when management refuses to provide extra funding for risk management, to cost effectively increasing capacity, to supply contracts that provide design extras, and more.

It can now be revealed that the Troubleshooter is Ron Riegel-Huth, a chemical process engineer with wide and varied experience in oil refining, wine production, and the white goods industry, amongst others. He is a graduate of the University of Adelaide - and my brother. I learned a lot from listening to his experiences in asset management in the private sector and I have much enjoyed reading these casebook articles again whilst preparing them for you. So please consider - and enjoy!

Wishing you all Happy Holidays and a Prosperous New Year,

Penny

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The Troubleshooter's Case Book.
1. Closing a Production Gap

The Situation:

The Factory produced a range of outputs including both small and large motors. Production was not meeting demand for its very large - and very profitable - motors. The manager argued lack of staff so more staff were hired. However the problem continued. The manager then argued insufficient capacity in a key machine. At this stage I was called in to 'find the problem and fix it'.

The Challenge

To find the cause of the production gap and to close it.

The Action

The first job was to take the time to understand the process flow and inspect the factor on the 'random walk' process, whereby inspections are scheduled randomly to ensure that observations take place at different times and under a wide range of conditions.

Preliminary analysis revealed:

- That machine capacity was not the problem - the suspect machine was only being used on two of ten randomly designed visits to inspect the process flow, and the capacity of the machine while in use showed it had more than adequate capacity.
- Although the shop floor was stacked with large quantities of various items of the work in progress, the stock of one item - the stator - was quite low.
- Examining the process for making stators showed that it went through a series of stages from making laminations, to building stacks, to inserting the wire, and then varnishing and baking.
- Working on the basis of rough times for each part of the process, it seemed that inserting the wire was likely to be the limiting factor. This was reinforced by the observation that each of the very large insertion stages was always occupied. Double checking figures confirmed the initial hunch.

On the basis of the analysis it was proposed:

- To build two more inserter stations to relieve the bottleneck, and
- Upgrade the best of the operators from large motors to very large, from medium to large, etc. and to start training operators for the small motors.

The Results

When the proposal was implemented, output increased by 80%

Lessons Learnt:

- A capacity planning module with accurate standard times would have picked this up automatically. However many batch production facilities do not have this basic data and instead rely on the experience of the crew.
- Don't assume, however, that the crew is correctly 'reading' the experience. Those that should know, often don't. This is a fact of life.
- Trust your training - gut feel is really more than a hunch, it is a non-verbal wake up call. It it seems wrong, it probably is. (A famous mathematician once said that if the results of months of work were counter-intuitive, he would throw them in the bin and start again!)
- Intimate technical knowledge of a process is not needed - sometimes it might even get in the way. Look instead for the logic in the process - and the illogical bits will stand out.

The Troubleshooter's Case Book. 2. Reducing Delivery Times

The Situation

In the last issue, the trouble shooter identified a bottleneck that was holding up production. As a result of the actions taken then, the factory's output of large motors had increased by 80%. The next problem to be solved was that delivery/lead times were long. From receipt of order to finished product, the process took 14 weeks - meaning that 14 weeks' worth of parts and sub-assemblies had to be controlled and managed.

The Challenge

Reducing the lead times would increase customer satisfaction, reduce work-in-process, reduce managerial load and improve profit.

The Action

1. Analysis revealed:

- The receipt of an order initiated an order on the foundry for the first - and longest - step in the process, the necessary castings.
- Then, allowing for a lead-time of the castings, orders would be placed for the subsequent steps, laminations, shafts, etc.
- The whole process took 14 weeks, that is, if all went according to plan, but any hiccup, say a porous casting, disrupted the schedule and delivery dates were missed.

- Large motors were specially designed for the client, each one might have a different end treatment on the shaft, say, or a different number of terminal boxes, and almost always a special paint treatment.
- Because of this customisation, they were regarded as ‘unique’ and given ‘one-off’ treatment.

2. Realisation:

Like unique houses, unique motors were built of relatively standard inputs. Rather than wait for orders to come in to start the process, a different start point could be taken. Stocks of common size castings could be held ready for use.

3. Proposal:

To hold stocks of castings for the 4 pole and 2 pole motors that were shown to represent 85% of the total and rather than order castings for each motor as needed, we could simply order castings to replace stock.

The Results

- Reducing the lead time reduced work in progress by 5 weeks, the costs saved on 5 weeks of semi-finished products, easily covered the costs of holding castings.
- Reliability of supply of castings improved out of sight as the castings shop was now able to work to a monthly plan.
- Reliability also increased for a human reason. As these major items were now made ‘for stock’ as opposed to a specific order, management found it easier to reject an ‘off-spec’ item, whereas previously, under the pressure of meeting order deadlines, the temptation to ‘grant a concession’ and allow it through was very high.

Bonus Results: A good idea blossoms

- Why just hold raw castings? Since every casting had a certain minimum amount of machining why not hold them in a semi-machined state? This would also enable faulty castings to be discovered without upsetting the production process.
- The laminations for the two motor types were also recognised as ‘common’ candidates and it made good sense tohold these on a max-min stock system and to produce accordingly.
- The sales people saw the benefits and they became part of the planning process - if they were tendering for a major order that could affect pre-calculated stockholdings, they would advise the factory floor.

Lessons Learnt

- Complex systems are always worthy of questioning - if it doesn’t ‘feel right’, it probably isn’t.
- Though the system was in need of overhaul, the breakthrough came through a change in mindset. Yes, each large motor was in some way unique - but only by concentratig on what was common was the factory able to change its methods.

Postscript

The improvement processes continued long after I left the division. Some time later, one of the engineers tracked me down to tell me of their good news - they had just completed an order from Mt Isa - in just six days!

The Troubleshooter's Case Book.
3. A Purchasing/Supply Philosophy. Part 1 of 2

Assets need to be maintained. Purchasing of consumables from paint to paper to power can affect your costs. Here is a purchasing philosophy that may have application in your area.

The Situation

At the time when we were putting bottles into cartons we had many problems, two are pertinent here:

1. Labels were scuffing in transport - giving a tawdry appearance on the shelf
2. Costs of carton were increasing regularly

The Challenge

To improve the appearance of our premium product (and calm the Directors as well) as well as pull back the rate of cost increase of cartons.

The Action

1. Analysis revealed:

- The bottling chief was trying in vain to solve the scuffing problem
- A review of history showed that about every two years the carton vendor was changed followed by a brief honeymoon of lower prices and much attention followed by regular price increases and little attention.
- Carton manufacturers had a common source of raw material and were all generally equipped with state of the art machinery.

2. Steps taken:

We called in a number of potential vendors and advised them that we were looking for two potentially equal suppliers and that their interest in our problems would be reflected in our interest in them as a vendor.

At the same time we advised all vendors that no one would get greater than 80% of our business, and that if one got down to 20%, he would have a reason to be nervous.

We set, and advised, the criteria for selection as:

1. Quality of Product.
2. Reliability of Supply
3. Technical Support
4. Price .....in this order.

The Results

We eliminated those who simply quoted on the high volume business and showed no sign of technical support (this eliminated most!)

Though it took months of effort, company “B” produced a wax lined carton that worked a treat. Company “A” then followed suit.

True to our word, company “B” gained 60% of the business. I took the local rep for Company “A” to lunch with his boss to stress that he had not lost 60% but rather retained 40% - it went well.

Our carton cost overall jumped by about 1/2% - dismay in Head Office.

However, when the vendors’ raw material cost rose they would ring and ask to go to lunch to discuss a price rise. Wow! Prior to this we’d just see a new unit cost on the invoice without so much as a letter.

We generally conceded on the low volume cartons but demanded a sharp pencil price on high volume stuff. Within 6 months we’d caught up with the original hike and dropped the rate of increase from about 8% p.a. to about 2% overall.

Lessons Learnt

A bit of competition is still a useful tool.

Use your suppliers, many have excellent tech support that’s not used.

Where volume can justify it, and there are two equal or potentially equal suppliers, it can be rewarding to use dual supply.

I’ve used this philosophy successfully many times but of recent times have struck resistance. Be careful - many of today’s computerised scheduling / purchasing systems assume just one vendor and one price. I’ve struck Logistics / Purchasing Departments defending the single vendor philosophy only to trace it back to their software system.

It is worthwhile overcoming the computer glitch - if you have it - because the multi-company purchasing philosophy, through managed competition, results not only in lower prices but in major design benefits.

... but I am getting ahead of myself. Stay tuned to this channel.

The Troubleshooter’s Case Book.
4. A Purchasing/Supply Philosophy. Part 2 of 2

In Part 1 of ‘A Purchasing/ Supply Philosophy’ I outlined the initial gains in dual sourcing of cartons. This issue covers the secondary - and more significant - gains that were to follow.

Situation

We’d sought and found two potentially equal vendors whose share of the business had been advised would be based on the following criteria - quality, reliability of supply, technical support, and, lastly, price.

Secondary Results

- Our vendors had overcome our technical problem and we'd slowed the rate of price increases.
- In hindsight I guess that it was natural to expect that the vendors would believe that Price was No.1 (it wasn't!) As to be expected they soon exhausted their price competitiveness (both were within cents of each other) and turned to other criterial in order to gain more share.
- Quality, Supply and Price were allabout equal and both company "A" and "B" turned to Technical Support in order to gain an edge.
- In the same month both asked to visit and I still recall they used exactly the same introductory phrase "We've been thinking about your business..."
- Company "B" said that they thought we really needed another carton sealing machine (they were dead right about that!) and they offered and installed a brand new unit at a peppercorn rent - with no strings attached. Company "A" came a week later to advise that they understood that we trucked finished goods to Melbourne and backloaded with packaging. They were a union shop and advised that they had placed a month's supply of our packaging in a nearby non-union warehouse just to protect us in case of an (unlikely) strike.
- This peaked with the advice from Company "B" of a price reduction! It transpired that one of the Melbourne staff was in Sydney and noticed a 'hot wax' machine in the salvage yard. They'd shipped this back to Melbourne, had it refurbished and were able to produce the same product more cheaply.
- In doing this for us, it opened up an unexpected market for them. This low cost carton was exactly what the fresh fruit market really needed. This sector needed a carton with enough moisture resistance to get fruit from the Riverland to the Central Market and then to the Retailer - this carton was it. Thus they took a huge slice of the expensive polystyrene (non-degradable) market. Now, was this 'win-win' or what?

Lessons Learnt

- Whereas companies tend to concentrate upon new customers we'd stumbled upon a mechanism for maintaining interest in existing customers.
- Companies "A" and "B" actually enjoyed the challenge and it was evident that their share of our business each quarter was a key indictor internally. Yet we were by no means their largest customer.
- The success was in part due to our up-front statement of selection criteria and that we stuck to it. We did not waver. We also met our side of the bargain and reliably advised both of their new quarterly share - and why.

When the 'More Money' solution fails - try something else!

Ed: How many times do we grumble when our 'first solution' (generally a 'more money' solution) is rejected? Take heart – there is quite often a better solution around the corner. It just requires a little thought – and an integrated approach.

The Troubleshooter's Case Book.
5. An exercise in risk management.

The Situation

There are two methods of removing stalks and bits of grape skin from wine. The old fashioned method, with which management was comfortable, was to use settling tanks. The newer centrifuge method however was quicker and had been in use for a number of years but always with the idea that, if necessary, it could revert to the older settling tank method.

What no-one had noticed was that, over the years, the size of the vintage had steadily grown – it was now too large for the old settling tank method to manage with the tanks available, which made the winery in effect completely dependent for its production on the efficient running of the centrifuge. Therein lay the problem for the centrifuge had a habit of "throwing" its bearings about "every other vintage". The last time it happened, it took about 2 weeks to get these specialised and expensive bearings from Europe. If this happened again we would be unable to handle the amount of grape and there would be a shortage of "bubbly" by the following Xmas.

Solution? We put a proposal to Head Office that we hold a set of these bearings on site. This proposal was rejected (But, curiously, we were allowed to order them if the bearings did fail – wait the two weeks, and lose production!)

The Challenge

To assure the winery's ability to handle the tonnage of grape and therefore protect the marketing arm from product shortage.

The Action

If we could not hold a spare set of bearings, maybe somebody else could?

We rang our local agent to ask how many of these centrifuges there were in the country and how common was this bearing fault. "Not many, not often" was the reply. Nevertheless we suggested that they might hold a set or two of these bearings here in Australia and they agreed. Furthermore, the storage site would be in our nearest capital city. We then devised a "break glass - turn key" approach whereby, for a premium, they would immediately courier the bearings to a halfway point upon a call from us.

The Result

Soon into the vintage the centrifuge did throw its bearings - at 4 pm on a Friday afternoon. Realizing that a courier would be impossible, the local manager personally brought them to the agreed spot. Bearings and paperwork were swapped and our man headed back whilst the maintenance crew were stripping the unit. The centrifuge was back on line in 6 hours - and stayed on line for the whole vintage. And the supplier never did charge the agreed premium.

The Learning

- Good suppliers can work minor miracles for you - if you involve them as an essential part of your business.
- Planning ahead, trying to predict problems before they happened, and thinking through possible solutions – really pays. ("What if" or "Risk" analysis in action)
- Without Head Office's rejection we would never have found this more elegant solution.

How Quantifying Life Cycle Costs Paid Off!

Ed: If you are frustrated by the tendency of your finance people to buy on price only, not on value, and you are convinced that the alternative higher capital price item would return life cycle efficiencies, take a lesson from this success story – and quantify!

The Troubleshooter's Case Book
6. Quantifying life cycle costs pays off

The situation

In early times our motors were easy to sell. They were of solid cast iron construction and had nice features such as being able to grease the bearings whilst the motor was running. Thus mining companies, conveyor designers would specify our motors almost automatically. Then the "boom" was over - and in hard times financial people became the managers - making decisions that were once left to technical people. Suddenly motors were being bought on price only. Further, as other countries suffered downturns, many saw Australia as an outlet for their motors. Dumping and similar practices became rife - particularly from South America. (it was later established that these motors were being landed at less than the cost of the steel and copper in their own country). Hence sales were "not good"

The Challenge

How to regain our market share despite the double whammy of price only and dumping?

The Action

After studying everything published by both the opposition and ourselves, it seemed that that we were pretty much on par with the competitors. However a brand offering a "high efficiency" range of motors was actually less efficient than our stock standard motors. Now we're talking 1/2 to 3/4 of a percent difference here. To communicate the impact of this to our customers we needed to "QUANTIFY".

Take a fairly common 37.5 kW motor, running two shifts (or 80 hours a week), 48 weeks/year and assume 10¢/ kWhr. For this level of use the running cost becomes $14,400/year which is about ten times the purchase cost of the motor! (A check in April 2000 says that nothing has changed, the ratio between capital and operating is still much the same.)

Gaining 1⁄2 to 3⁄4 of a percent difference may not seem very large, but it represents some $72 to $108 a year per motor – or about 10-15% of the initial purchase price on a two year pay-back period. (Even higher if working a 6 or 7 day week!)

We knew that the price differential between us and the dumpers decreased as the motors increased in size, so our efficiency gains were likely to really tell in our favour for the larger 500 hp (375 kWhr) motors.

This information was put to all the State Managers at a national sales conference. They were shown how to calculate the life cycle efficiency savings.

The Results

Some days later, the State Manager went to a major northern mining company where he had lost an order to a South American motor supplier that was dumping. He used the life cycle costing calculations to show that the extra cost of our motors could be justified, due to their 24hr/day 365 day operation, on a 3 month payback basis. Two days later the company rang back asking if our motors were still available. Apparently our contact had discussed this with his accountant and since they generated their own power at more than twice the cost that we'd allowed and they ran 21 shifts/week for the whole year, the payback was even lower than we suggested - of the order of 1.5 months! Thus we actually stole an order away from a "dumper". Smiles all round.

The Learning

- There was the general feeling that we were more efficient - but it was more of a "feelgood" thing than a marketing tool. Once quantified it became a tool.
- It was necessary to change with the times. Selling tech products to techs was once sufficient - now it was necessary to sell to non-techs and therefore to understand and appreciate the "new" customers needs.
- In retrospect this was an example of the universal rule - know your customer's needs better than they do.