Improving SMART Gas Meter output by 72% in 9 months without CAPEX

A case study of delivering lasting step improvement

Adrian Howe
m: +44-7702-444744  e: a.howe@chartwell-consulting.com

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Chartwell is a specialist implementer of rapid operational improvement

About us

- Founded in February 2013
- Offices in London, Berlin, Zurich and Boston
- 33 employees and growing
- We work all over Europe and worldwide
Like Simon Sinek, I’ll start with “why”
Why we do what we do – a personal story

This is Karl-Christian Hansen. I worked with Karl-Christian at the start of what became the global change programme in the wind energy leader Karl-Christian and his colleagues were living with major quality problems, such as “dry glass” that resulted in:

• 1 in 20 blades being scrapped
• 1 in 5 mould days being lost due to rework
• 28% resin waste

After 3 months of coaching, Karl and his colleagues had:

• Made 100 blades sequentially with no “dry glass”
• Eliminated the lost mould days, so output went up by 25%
• Reduced the resin loss by 71%

I asked him whether he thought that this achievement would have been possible and what he had learnt:

“I would never have believed you. I can do a lot more than I think I can”

This is a fundamental principle upon which we founded Chartwell:
To replicate this belief in all organisations with whom we work
What do clients in diverse industries have in common?
They all recognise huge hidden potential, that they want to recover
We are results-focused, rather than activity-lead
You can deliver 20% - 50% improvement in a few months without CAPEX
We put our skin in the game
Performance guarantee

Our work should deliver superior value:

We don’t take on work if it won’t pay back at least 4 times our fees

Accountability is key in getting results. This applies to us, as well as our clients:

Our implementation projects are covered by our “no result, no fee” guarantee
Case study:
Improving SMART Gas Meter output by 72% in 9 months without CAPEX
“What am I going to share with you?”

About the case study

This case study shows some of the highlights of a recent project that I am very proud of:

• The client team achieved a 72% increase in output
• They reduced their scrap cost per product by more than 50%
• Most importantly, they have continued to improve since we left at the end of March

We will take a look at:

• The assessment
• Mobilisation and implementation
• Sustainability

I will try to highlight some of the important enablers, that you can maybe take home and hopefully help you to drive your rate of improvement and implement change
We were asked to deliver step improvement and help drive long-term growth

About the client

About the client:
• Industry      SMART Gas Meters
• Revenue       >£100m
• Employees     > 600 on site
• Part of a larger group, parented by a Japanese multinational

About the project:
The site had already improved significantly, but still needed to quadruple output in 2 years
A capital plan was in place, however this would take 18 - 24 months to come on stream - It would not address the order backlog or the 2017/18 plan
The assessment

“If you want to go up Mount Everest, then have a very clear game plan”
We assess the business in four “layers”
Understanding more deeply why opportunity exists

Opportunity Value
- Total value of all improvement from output, raw material yield, inventory, quality/risk, capital avoidance

Operational Performance
- Zero-based effectiveness and trends, top loss trend, detailed study of failure modes and organisation’s response

Improvement Cycle
- How effectively is operational loss measured, prioritised, resourced and acted upon to permanent root cause solution

Leadership and Culture
- The mindset, behaviour and actions of the leadership team to create an environment in which improvement thrives

By viewing the situation in this way, we are more likely to be able to deal with the underlying organisational conditions that allow the opportunity to exist
We have 35 assets and 500 people to look at
Performance assessment

The situation
- There are 35 different assets across 10 sub-processes
- There is product mix dependency
- Several suppliers are also capacity constrained

The challenge
- At some point, every asset in every sub-process is going to require de-bottlenecking
- There is a mixture of automatic and manual processes and some technical constraints to solve
- This needs to be done in a very deliberate order to make maximum improvement in the shortest time
- We can’t boil the ocean, so we want to ensure we make the best use of resources and at the same time, transfer skills to ensure sustainability
“Zero Loss” concept gives a complete view of potential

Zero Loss definition

What is Zero Loss?

Zero Loss Efficiency = \frac{\text{Time required under optimal conditions, without losses}}{\text{Amount of time actually used}}

* No loss from speed, downtime or quality

This principle can be applied to almost any process. We most often apply it to:

- Asset time / efficiency
- Raw Materials
- Energy
- Labour
- Manufacturing cost
When we do this, we find far more potential than anyone thinks possible

Zero based potential per process

- Hidden opportunity exists because people don’t see or believe the potential of their process
- We use a zero based approach to understanding losses and cycle time
- For example, build cells are running at 30 second cycle time – the team identified and delivered opportunity to run at < 22 seconds

Whilst this approach exposes more opportunity, it means we have to solve “speed of sound” type constraints

An internal exercise had been done, we found a lot more potential – think of it as speed and hidden lost time
There are multiple bottlenecks to overcome, one after another
Capacity profile and line improvement strategy

We cannot work on all of these projects at once – and nor would we want to:
• We have a finite amount of time each day and finite resource to take action
• Not every action will get us improvement right now (come and try our de-bottlenecking exercise afterwards)

Any supplier can and will limit effective line end output, unless we work on them in parallel

* Hiring of 2nd operator for all shifts to consistently hit 4-lift target
* Tube build, CAW and Customisation currently have latent capacity that is not required, hence the low baseline
We model what happens over time as we work on each constraint
“Tube map” – output profile per process over time

- Each asset group has its own improvement line over time
- The lowest at any point in time determines the maximum nett throughput
- If we work through the sequence of projects, we can predict what the overall nett throughput will be
- Each asset group has its own improvement line over time
- The best we can achieve is the lowest of these (the shaded area)
And we work with the client to build up the game plan
Programme plan – phase 1

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Mobilisation and Implementation

“A great plan is only as good as the execution”
We use a proven approach to change
John Kotter – Leading and Accelerating Change

• We apply the principles prescribed by John Kotter
  • 1996 Leading Change
  • 2014 XLR8 (Accelerate)
• These books offer a good structure for change that is also results focused
• In this project, our efforts centre on:
  1. Describing the opportunity in a way that everybody can understand to create urgency
  2. Enlisting volunteers to start many pockets of improvement
  3. Creating quick wins, using them to motivate and convince the rest of the organisation
  4. Creating a sustainable vehicle for improvement

Source: John Kotter XLR8
Get the whole senior team deeply involved & enlist a network of volunteers
Mobilisation - critical success factors

For this programme, the critical steps are:

- **Leadership alignment** – a number of background sessions are run until we have a “critical mass” of support. Discuss the potential roadblocks ahead of time with your new guiding coalition. Know the value of the opportunity when someone says “this is too difficult”

- **Communication** – we run 7 two-hour briefings for over 700 employees – stopping the shifts so people knew it was important. Repeat the message until it’s understood

- **Asking for volunteers** – we need a range of skills on the pilot project teams and everyone who touches the product to have a say. Don’t choose all your “favourites”

- **Giving people the time, skills and support** – if you expect your folks to do improvement in their spare time, it will usually be the least urgent task on their plate. If it’s worth doing, dedicate the resource and backfill key roles

- **Leadership presence** – regular touch points and visibility to demonstrate importance. Be there in good and tough times to show you care and want to help
The first results you get set out your stall for the rest of the programme
Unit A Team – “Beacon Project Team”

The first round of results are critical:

• It shows what really can be done – the potential is not just theoretical and should be celebrated
• This is not just another poster campaign, you are doing what you said you are going to do
• People can be empowered to fix things, if the conditions are right
• Getting results (and recognition) is fun

Doing what you say you are going to do builds credibility and belief that step improvement can happen in your plant
Create and bond a network of improvers from across the organisation
The PACE Room – a centre of excellence for improvement

- The whole programme is run from a project office – a base for the teams who spend most of their time on the shop floor
- Each team has its own boards with daily updated KPIs and simple visual management of actions
- Leadership presence at weekly reviews is “mandatory”
- “On feet” meeting

- Each team has a dedicated lead and some full and part time members
- Chartwell provides training and on the job coaching
- No time is spent on “window dressing” PPT slides => focus on results
- Shift management is embedded in the teams to help roll out improvement and embed new processes through SOPs and training on the shifts

Working this way demolishes inter-departmental boundaries, creating One Team
Fix the hard stuff, not just the low-hanging fruit
An example of technical constraint breaking

• It's not all about doing the obvious “low hanging fruit” – of course there are easy wins
• If you have been improving already, it is the big gains that will come from breaking the more difficult constraints
• These problems require a very robust problem solving process
• New skills and coaching come in to solve issues that people don’t believe are possible
3 months in, we are de-bottlenecking the “full flow” testing process
Full flow cycle analysis

- People know how many meters they process and they guess that the average cycle time is “about 15 minutes”
- What they don’t know is what the “best observed” and “golden cycle” times are – so they don’t know how much improvement potential there is:
  - The average is 18 mins
  - The best cycle we see is 12 mins
- What we find is that loading is a small part of the total cycle – asking people to work faster won’t gain much
- We need to dig down further into where in the cycle this variation is happening

Understanding cycle time variation is completely hidden and its value is therefore not understood
We deep dive into the machine code to understand what is happening
Phase step cycle time analysis

Flush was being done with one of the smaller nozzles. We swapped these out and installed new filters
This constraint is completely removed
Immediate impact seen from the 600L nozzle change

- This process had become the factory bottleneck. It was completely hidden in the past
- Nothing else we did would increase output until this was resolved
- After months of record weeks, people were questioning whether we really needed to do this modification
- They were only convinced once the results came in on the first modified machine

1. Beware improvement fatigue
2. If you smash enough constraints, you will make huge gains
   If you don’t heed these 2 points, improvement will stop
The client team improved output by 72%

Results

- Over the course of 9 months, the client team was able to make a massive step in performance and productivity.

‘The critical improvements that our work with Chartwell delivered brought our company’s planned deliveries back on track and ensured that we were prepared for the unprecedented ramp in demand that our customers have requested over the next five years.’

– Steve Cunningham, Senior Vice President Infrastructure Programmes, EMEA
Sustainability

“Make sure you nail down every detail of the new behaviours and habits”
Step results are one thing, what about sustainability?
Working out key levers for long term improvement and change

To understand the reasons why opportunity exists, we do an in depth study during the implementation

- We reflected on 20+ years of experience to develop the HPO framework to look at the right drivers for results
- The model has 8 main headings and > 80 sub-objectives, each with individual criteria

This enables us to work with clients to build a tailored solution, with the right conditions for improvement to thrive

A High Performance Operation will deliver sustained best in class rate of improvement year after year
Some highlights: building habit takes time and repetitive effort

Production Office: The operations manual

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<th>Lead</th>
<th>Attendees</th>
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**Daily Department Meetings**

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- We work with shifts and departments to codify and implement the “Landis Way” of doing the day job and improvement in shift management, supervision, maintenance and supply chain
- A new RFC (Request for Change) process is established to fast track improvements
- These are trained, auditable processes
- On a six month follow up visit, the routines are running better then when we left
Since we left in March, productivity has continued to improve
Financial impact statement from CFO

- When we left, scrap cost per meter was down more than 50%, saving £1.4m
- Labour cost per meter was reduced by 29.9%, valued at £3.4m p.a.*
- On a follow up visit at the end of September, further productivity gains had been made, taking total labour cost savings to £5.2m p.a.

* Based on 3 month rolling average
Key learning points
If you want to win matches, get the right coach
Why does this approach get results?

We see the role of the Chartwell staff as akin to a coach or personal trainer:
• The coach is there with you on and off the field until you achieve your objectives
• Minor changes to technique, thinking ahead, creating passion and belief to win
• Direct access to the top for resources normally not available to the individual
• Our aim is for your team to get winning results. **Faster and better than the competition**

Choose a coach who focuses on results
Take Aways & Questions

Alignment
- Know and refer to the value of the opportunity
- Create a guiding coalition that won’t give up at the first hurdle or keep changing priorities

Communicate
- “The problem with communication is the illusion that it has happened”
- Do x10 more than you are today

Create an army of results focussed volunteers
- Give them time, skills and the right coaching support
- Work on the constraints, not just “low hanging fruit”
- Activity does not equal results

Be a visible servant leader
- “Be the change you want to see in the world”
- Beware improvement fatigue
- Keep it fun - spread the word and grow your network of improvers