Lean Manufacturing Driving a 5S Process at Gurit

From Possibility…

Gurit is an international composites and resins manufacturing company with plants in a number of European countries. The UK site on the Isle of Wight was formerly known as SP Systems. This site employs about 450 people and specialises in the manufacture of materials used to make wind energy blades, marine products and high performance cars. Having been established in 1980, SP Systems became part of the Swiss conglomerate Gurit in 2003. The key products produced are '**prepregs**' – glass, or carbon fibre, sheets impregnated with resins - and the bulk resins and hardeners used to layer the sheets together. SP Systems has previously received numerous awards and commendations, and in late 2004 was voted Best Business in Britain by the British Chambers of Commerce.

A previous Ad Esse case study has looked at the overall approach to Lean Manufacturing and the way in which our consultants supported the review and improvement of product and information flow around the organisation. The aim of this paper is to look at the 5S process and how this has continued over the last 12 months with minimal input from Ad Esse.

WHAT WE MEAN BY 5S

In simple English the 5S's are Sort, Set-in-Order, Systematic Clean, Standardise and Sustain.
The underlying philosophy behind 5S is that a manufacturing plant, office or other work place should be organised, orderly and clean, with the good running of the processes in the area evident to anyone coming in. This means that the workplace is designed and operated in such a way that anyone visiting can tell if the plant and equipment is running as planned; the so-called obvious, or visual, factory. Visual management allows the team to monitor and manage their own performance without lots of data being recorded and analysed. All activities can use visual clues to show if the process is performing as it should be.

To achieve this, everyone must work towards establishing an orderly, clean and organised working environment.

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The five stages in progression to the organised, obvious, visual workplace are:

- **Seiri** (Eliminate) - Get rid of everything that is not being used or is not essential for doing the job.
- **Seiton** (Order) - Identify the right place for everything and then put everything in its place. Look at what is used most often and put it nearest to those using it. Find easy ways of ensuring that everything is in its right place and that nothing can be put in the wrong place.
- **Seisu** (Clean, check and return to its original state) - The factory/office and all the machinery and equipment should be in good working order, and the team is responsible for keeping it working and clean. Prevent things getting damaged or lost by keeping things as they should be.
- **Seiketsu** (Systematise and Standardise) - Establish the standards and formalise them, make all the standards visual if possible. Place visual reminders of procedures where they will be seen (often called 'one point lessons').
- **Shitsuke** (Respect and Improve the Standards) - Audit against the standards and use the results of the audits to continue to improve the standards and eliminate waste. Move towards the obvious factory or office with visual management.

Each of these needs a detailed explanation and training, but as an example, the benefits of the '**Sort**' stage are indisputable. Walking around most shopfloors and offices shows that people accumulate rubbish, so much so that it eventually prevents them working effectively. A review to challenge if all this rubbish is still needed can created enormous amounts of removed clutter, increased space and reduced waste.

The implementation of 5S is a long and difficult process as it relies upon changing the habits of every employee in an area. All must adopt new working practices, and if attention slips, the old disorder can return with frightening speed.

Like many organisations, SP had a manufacturing shopfloor that was disordered, grubby and non-visual. Items were stored where there was space rather than where they were meant to go, and if there was no space, they just went in front of something else or on top of it. The flow of materials around the plant was not obvious and there was little use of visual indicators to allow operators to see if everything was operating correctly.

The plant could be tidied up for an official visit, but the housekeeping standards were not sufficiently owned by everyone to keep all areas clean and tidy. The plant was not poor by average standards, but it was a long way short of the perfection sought in a Lean process.

To Actuality…

The 5S process is dependent on teams of operators owning an area and then working through the first three S's in sequence to arrive at the ultimate vision of a visual factory. In SP, we worked with Russell Taylor, the SP Lean Project Manager, to break down the whole shopfloor into distinct areas, each owned by a different team of operators. In each area we then developed a timetable for the teams to go through the first three S's, ensuring that they were not being forced to go too fast and that the internal facilitation resource would be able to apply effective hands-on support.

SORT

In each area we started with the '**Sort**'. This involved stopping the machines and getting all operators in an area to red-tag any item that they suspected was no longer required in the workplace. Operators were trained in the tagging process and were shown photos of their area taken that day. For some reason, it is easier for people to see 5S problems when they are photographed than when they walk past them in their day-to-day work.

Once tagging started, items tagged included old tools, broken equipment, out of date procedures, chairs with three legs, etc, basically anything that could be removed without affecting the smooth running of the plant. We removed any items that were obviously not required and put all contentious items into a quarantine area. Any item not used in the month was removed from the quarantine

area and thrown away or '**auctioned-off**' to other areas that might want it.

Quotes from when Sort sessions were run inside Gurit UK included:

"Do you realise how much that item cost?"

– even though it was of no more use.

"We used those labels a year ago and we may use them again soon"

– even though the labels had been several layers down in a pile that was not organised or archived
– not the easiest to find in a hurry!

SET-IN-ORDER

The '**Set-in-Order**' stage involved more tags. This time indicating everything that was in the wrong place, was not fully operational or was missing. The Set-in-Order stage involved solving the many hundreds of problems of where to keep things, how many things are needed and how to replace them before we run out. The process was iterative, with the initial blitz being repeated in each area a number of times to resolve all the process flow problems associated with materials and equipment storage.

SYSTEMATIC CLEAN

The third '**S**' of '**Systematic Clean**' concerns the installation of procedures and checks that ensure that all equipment, tools and areas are kept clean and regularly inspected. All equipment is cleaned and restored in a major blitz and then good –housekeeping systems are put in place to keep machines and areas clean.

THE OTHER TWO S'S

Although the formal 5S process implies that Standardisation and Sustain are something that happen at the end of a 5S process, in reality, they are applied throughout the first three stages. New procedures, templates, photos and instructions are written to capture learning and prevent back-sliding after every improvement activity.

PROGRESS AND LEARNING POINTS FROM GURIT

As previously stated, 5S is about changing the habits of a lifetime. It is always a battle against the forces of apathy, disorder and overwork. Gurit on the Isle of Wight can now point to some dramatic improvements in the levels of cleanliness and organisation in the workplace. This has been achieved via a number of factors; constant communication, good facilitation and the taking of ownership of the process by the line supervisors in the plant.

THE ROLE OF THE INTERNAL FACILITATOR

Ad Esse has always believed that the only way that a Lean process can succeed is with the training and support of an internal change management capability. The selection and training of a Lean Project Manager and Lean Facilitators is key to the success of Lean. Gurit has not shirked from resourcing Lean, with a full time project manager, a full-time Lean facilitator on nights and half a dozen part-time Lean facilitators working on the other shifts.

Once this team was trained by Ad Esse they conducted all the 5S awareness sessions and improvement blitzes themselves. This has been essential, because it allowed them to run two or more sessions with the same production teams spread over a number of months; reinforcing messages and encouraging progress. It also meant that there was always someone in the plant able to provide information or coaching to operators or line management in real time, rather than the next time the consultant visited the plant. The fact that the facilitators were line operators themselves just helped the integration of the 5S philosophy even more.

All production teams have had briefings on each stage of the 5S process. They have taken part in tagging operations, in machine cleaning, in organising the layout of their workspace, in the identification of the best tools for each job and where they should be stored, and all with the facilitation and support of the Gurit Lean team. The internal team has driven the process, setting the timetable and organising each event.

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OWNERSHIP OF THE PROCESS BY LINE MANAGEMENT

Gurit was not unique in the fact that its line management were cynical at the start of the Lean process. Many previous initiatives had been tried with marginal success, so when the Lean and 5S concepts were introduced there was a general '**wait and see**' attitude. Over the last year, as benefits from flow and changeover blitzes have vastly increased productivity and reduced waste, there was a general acceptance that some Lean tools were very effective, but the application of 5S was still problematic.

Only with the constant support of line managers by the Lean team have the strictures of 5S begun to be part of the day-to-day management of the production teams. The review of cleanliness and organisation now takes part in weekly shopfloor meetings and it is now line supervisors that take responsibility for addressing the daily 5S issues raised by the team.

The plant is now much cleaner, many more signs and diagrams indicate how processes operate and where things can and cannot go, and the setting aside of time to deal with 5S issues is now seen as normal. The benefits are less waste, a greater confidence that quality and operational standards are being maintained and a factory that does not need a special effort to present it to customers. Roles are more clearly defined and it is easier to spot problems on the shopfloor. There is still a need for internal facilitators to support the 5S process, but it now a case of guiding rather than forcing the continuous change across the organisation.

Gurit UK has now developed a 5S audit process where managers from different areas conduct an audit visit and then agree timescales for when actions are to be completed by. With this process we are continually applying dissatisfaction with the current state via the 5S process.

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