

## YOUR LEAN TOOLBOX

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*This column will appear on a regular basis and aims to give an introduction to the tools and techniques for Lean Manufacturing.*

### 5 S CONCEPT

The 5 S concept has been associated with Total Productive Maintenance (TPM) and workplace management in manufacturing for some time. However, it is now being used in services also. 5 S is fundamental to quality and productivity. It is the foundation stone.

The 5 S's stem from 5 Japanese words. It is a name that has stuck, despite the fact that few English speakers understand the Japanese words. However, there is an English equivalent of the 5 S's which more or less mean the same thing. There is also the 5 C's covering the same ground. So here are the 5 S's Japanese, 5 S's English, 5 C's and English ordinary:

- Seiri, Sort, Clean up
- Seiton, Straighten (or Simplify), Configure, Orderliness or Organisation
- Seiso, Scrub (or Sweep), Clean and Check Regularly, Maintenance
- Seiketsu, Standardise, Conformity
- Shitsuke, Self Discipline, Custom and Practice, Training and Routine

All this may sound draconian, but is in fact the basis of quality and productivity in factory and office. As Taiichi Ohno, Toyota's legendary innovator of the JIT system said, 'Management begins at the workplace'.

### Clean up

Clean up is about removing all items (especially accumulated dirt and grime, but also inventory, paper, furniture, tools, memos, manuals, rubbish, filing cabinets, etc.) that are not required or are unnecessary within a period ahead. Such items are waste, or lead to waste. They take up space, lead to extra walking around and lead to waste of time whilst searching for needed items buried under piles of less important material. An office example is the 'clean desk' policy run by several companies, requiring employees to have a clear desk at the end of each day. In the office beware of paperwork that is shuffled, re-read and searched through often several times per day. It's all waste. Clean up also includes fixing: any tools or equipment that is broken or not calibrated must either be thrown away or repaired: decide which, and act.

According to some 5 S enthusiasts, one can make a judgment on the status of productivity and quality within seconds of walking into a factory, office or warehouse. Beware!

There are two approaches. One is to begin with a longer period (say 6 months) and to clear all that is not foreseen to be used within that period; then to reduce the period until you are working with only (say this week's) items. The other approach is to 'red tag' items where there is uncertainty. The item is not removed but the tag indicates when it was tagged and if found be unused for a specified period (6 months?) is either thrown out or removed to a storage location. Inventory, of course, is also a candidate for red tagging: don't forget stillages in the second row.

### Orderliness

Orderliness is the well known (but probably less well implemented) 'a place for everything and everything in its

place'. Orderliness should be the next step after clean up. The idea is to minimise waste (see the '7 Wastes'). It is really about having things easy to hand, labelled, classified and easily visible. Shadow boards may be used for tools, books arranged by topic, shelves not too high, wheels on carts, heavy low and light high, colour coded connections and pipes and so on. It is also about inventory: having specific locations for specific parts, perhaps painted squares and of course a limit on excessive parts delivered lineside too early. When combined with clean up, this lays the foundation for the KANBAN system.

Orderliness has a direct impact on productivity: searching for lost papers and tools should be eliminated. And time wasted should be cut by careful location of tools and materials. Do a Pareto in order to locate the most frequently used items close by. It may be possible to incorporate some failsafing: cords attached to tools, racking or slots which do not hold other than the correct tool.

### Clean and Check Regularly

Clean and check regularly is of course about keeping things clean and ready to go. This step follows clean up and orderliness. The important point is that this is not delegated to some cleaner, but is done for oneself, on a regular ongoing basis. It needs to be done daily. It is about pride. Workplaces can never be too clean.

Cleanliness extends to non-seen areas: machines need to be clean inside and out - in fact, making the innards of machines visible by using transparent covers is desirable. Routine maintenance may be incorporated: oil every day, replace after 5000 sheets and 'aircraft style checks' where items are checked at the start of every shift (have you ever been into a bank to discover a non-working pen chained to the counter?). One important activity is identifying which maintenance activities are the responsibility of the ordinary staff and which are the responsibility of specialist maintenance staff. Responsibility for the photocopier is good example; clearly define who is responsible for what: secretaries, staff, specialists.

A note in passing: one reason for Japanese success at quality is said to be their natural obsession for cleanliness. Most Japanese regularly visit the 'onsen' or hot spring bath, take at least one bath per day (many women take two per day) but scrub before getting into the bath - lying in dirty, soapy water is a no-no.

### Standardise

Standardise refers to engendering the HABIT of workplace procedures. It is about the establishment and maintenance of standards. The first standard is to ensure that the previous 3 S's are in place and maintained. Then there is the discipline of work itself. Despite what some people think about Frederick Taylor, there is one best way to do any task which will minimise time and effort and maximise quality and productivity. To some this may sound like boring repetition, but job interest should not be confused with the best way to do it. Standards establish the foundation for further improvement. They are part of the Deming cycle of Plan, Do, Check, Act or Standardise. Also included in this category is the routine of health and safety: making it the habit to wear safety glasses, gloves and ear plugs.

Standards should be kept lineside and be diagrammatic (first preference) or written. Never verbal. Standard procedures can be colour coded to match the product which carries a label of matching colour. When an engineering change occurs, a number on the product should match the number on the standard sheet.

Any standard should cover not only what to do when things are normal, but also what to do if things go wrong.

Discipline is to make sure that the activities are kept going. This amounts to identifying responsible people, setting the frequency of review (the previous steps won't last forever) and maintaining a visual record for important equipment.

Management has an important role to play here. Prevention is the watchword. But even better than prevention is failsafing (or 'pokayoke' see section on Shingo), whereby inspection is automatic and a warning occurs. Examples are automatic counts on cutting, showing a light when tool change is required, or automatic back-up of hard disk. One way is to establish regularity of procedures. Nissan does a 60 point check every week. Checklists are gone through at the beginning of every shift and charts completed at the end. Another may be incentives: a prize for the best workplace. These principles are as applicable in service as in manufacturing.

Management participation and interest is of course vital to keep a 5 S programme going. Expectation and example are important. Management must be seen to practise 5 S themselves and to maintain commitment.

Dramatic savings often result when 5 S is introduced. It is the basis of 'kaikaku' or 'instant revolution' described by Womack and Jones in their book *"Lean Thinking"* and by Johnson in *"Sid's Heroes"* (who claims 30% improvement in productivity in 2 days!).

**Note:** The full editions of the books from which these extracts are taken are available from the Institute of Operations Management Bookstore.

*Extracted from: John Bicheno, "Cause and Effect JIT", PICSIE Books, Buckingham, 1994. Available from The Institute at £4.95.*