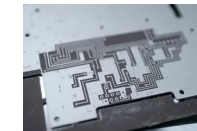
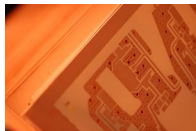


Lean Manufacturing at Spirit

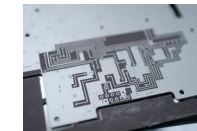
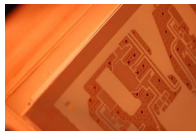
Martin Randall

Operations Director - Spirit Circuits Ltd



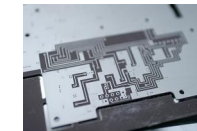
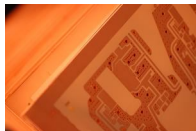
The next 20 minutes....

- Potted history of Lean
- What is Lean?
- Lean Goals & Principles
- Why Lean @ Spirit
 - Where we are now - Visual Management and 5S &
 - The Future



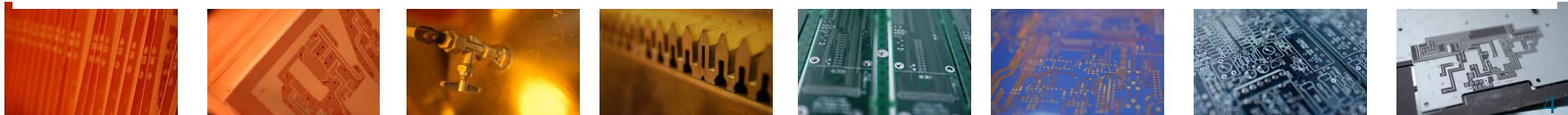
Potted History of Lean

- Lean manufacturing is a generic process management philosophy derived mostly from the Toyota Production System (TPS) developed between 1948 & 1975
- Originally called “Just In Time Production”. The term LEAN was not coined until 1988 in the USA
- Lean manufacturing or lean production, or put simply, "**LEAN**", " is a practice that considers the expenditure of resources for any goal other than the creation of value for the end customer to be wasteful, and thus a target for elimination.



What is Lean?

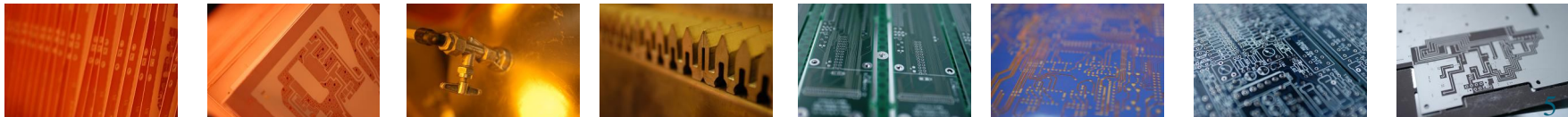
“All we are doing is looking at the time line, from the moment the customer gives us an order to the point when we collect the cash. And we are reducing that time line by removing the non-value-added wastes.” Taiichi Ohno, Toyota Motors.



What is Lean?

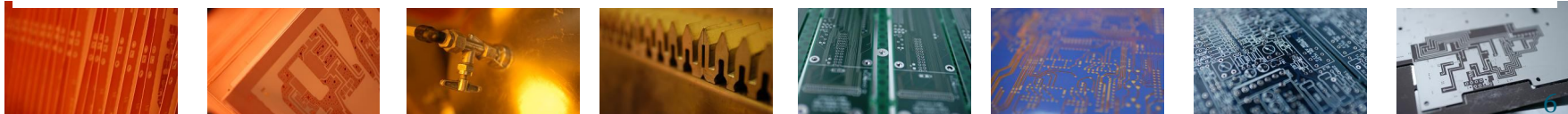
*“The core idea is to maximize **customer value** while minimizing waste.*

Simply, lean means creating more value for customers with less resources” *Bob Womack*



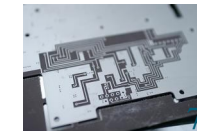
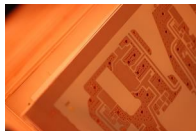
What is Lean?

- Lean is a system.
- Lean is a practice, not just a philosophy.
- Lean is fundamentally about knowledge gained from rigorous problem solving.

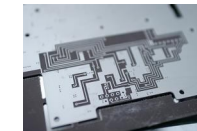
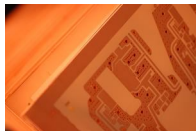


4 Goals of a Lean Manufacturing System

1. Improve Quality.
2. Eliminate Waste.
3. Reduce Time.
4. Reduce Total Cost.

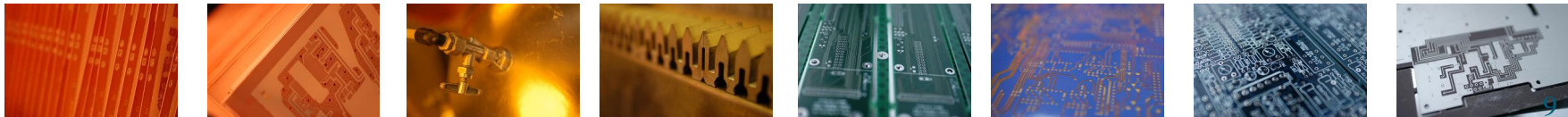


5 Principles of Lean

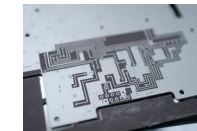
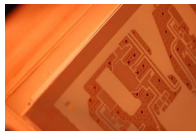
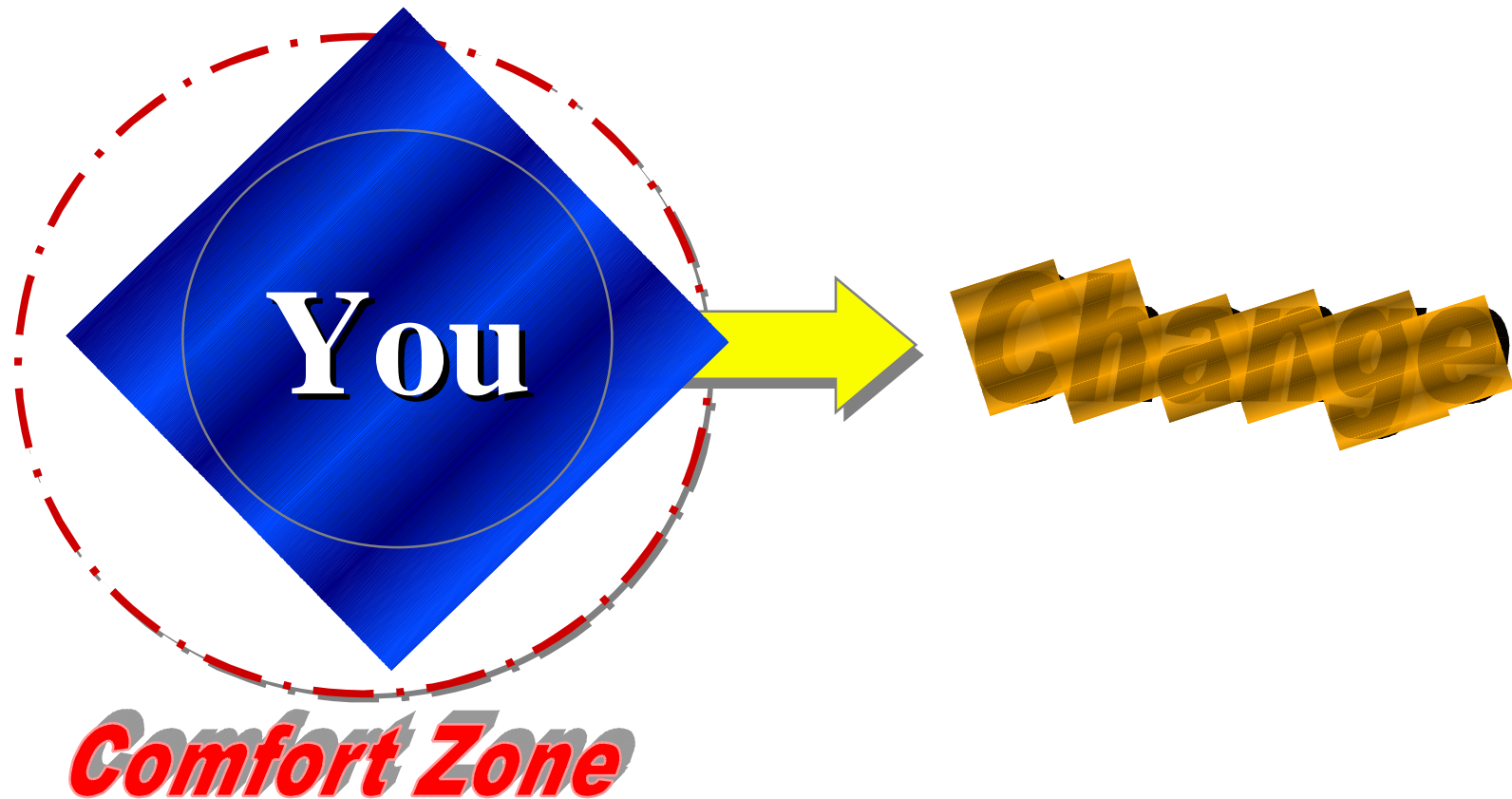


Changing the Culture

- Many organisations that have started a lean journey have found their biggest problem is sustainability.
- This is not the problem but the symptom – **The problem is actually a failure to change the culture.**
- It has been estimated that 80% of change projects that fail do so because “leaders” fail to manage the people issues associated with the change



Resistance is Normal

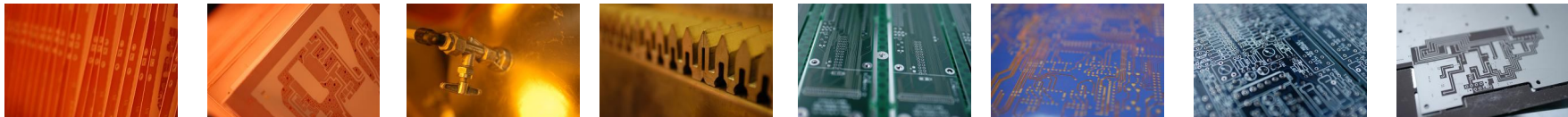


Traditional approaches to change

“Do what I tell you; I don’t care what you think.”

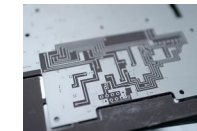
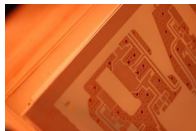
“You are wrong, let me tell you once again the facts.”

“Those who decide not to change won’t be here long.”

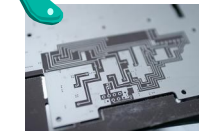
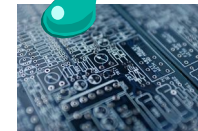
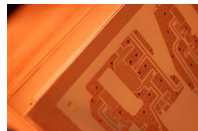
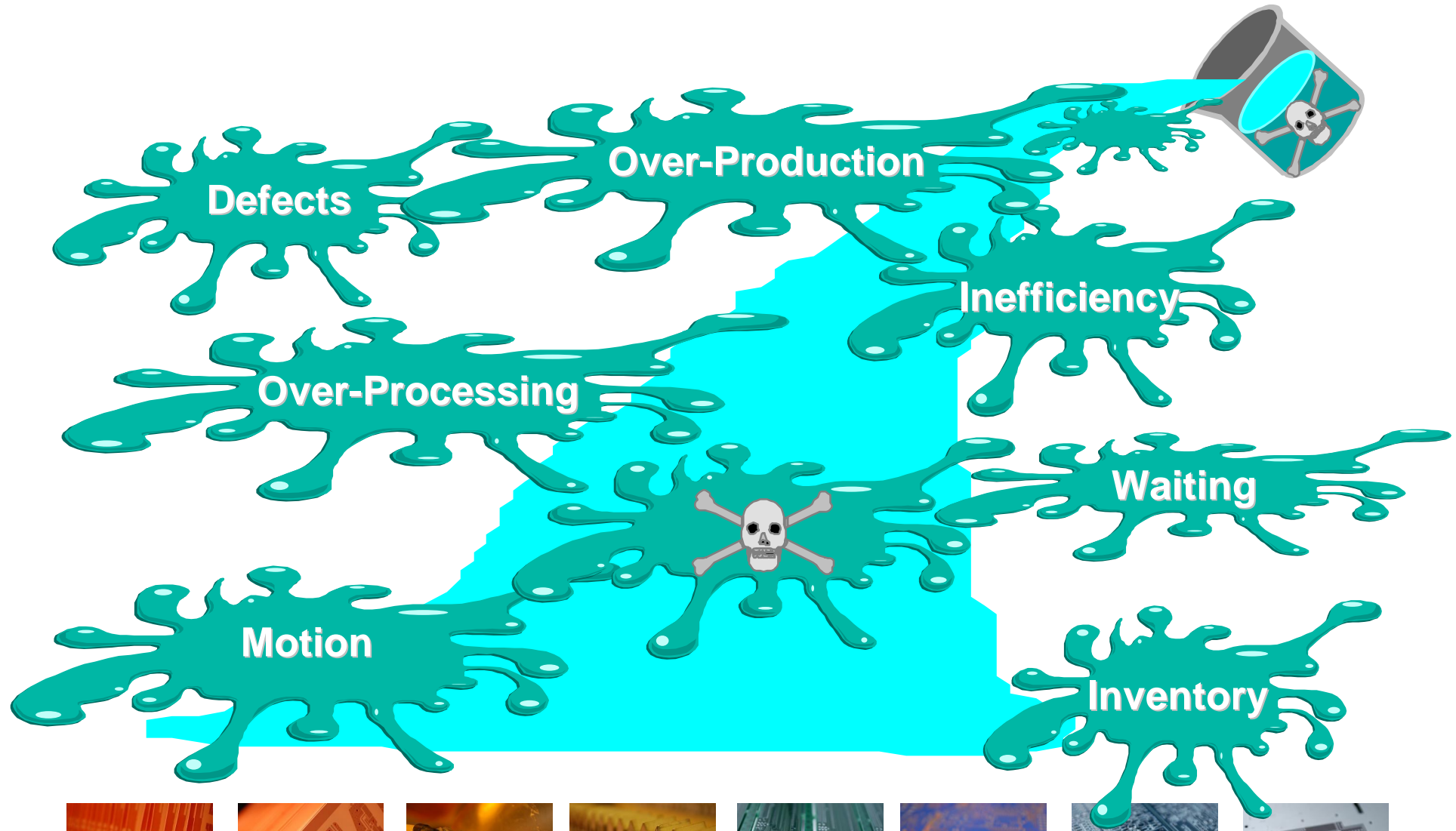


Lean Tools/Techniques

- ✓ 5S & Visual Management
- ✓ Standardisation (Best Practice)
- ✓ Value Stream Mapping
- ✓ JIT, Pull and flow
- ✓ Kaizen
- ✓ 7 – Deadly Wastes
- ✓ TPM



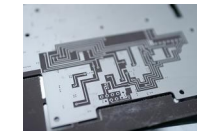
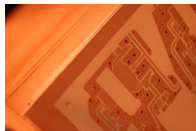
The 7 Major Wastes



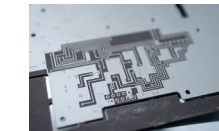
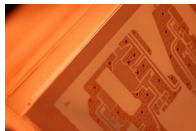
Spirit @ Jan 2010

How can we...

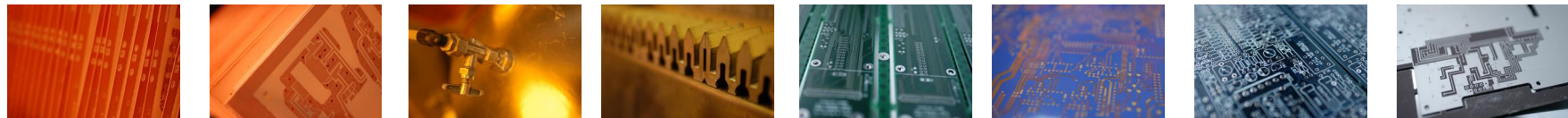
- Maximise Production Capacity
- Reduce Waste
- Reduce Variation
- Improve the bottom line



I have a good idea – what we need
is Lean ...

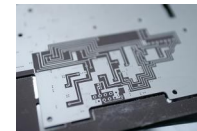
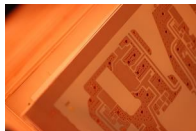


Great...lets add that to the list !!



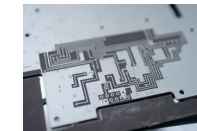
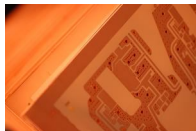
LEAN @ Spirit....where to start?

- Started in January by inviting Mark Knowlton (Business Improvement Specialist) to run a staff awareness Day



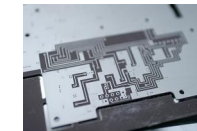
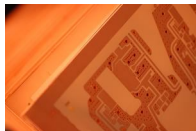
LEAN @ Spirit....where to start

- This confirmed that we needed to recruit an experienced LEAN practitioner
- Jason Barnett joined as our Lean facilitator at the beginning of March



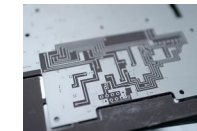
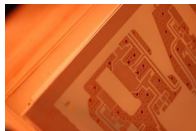
How did we start? What Have we Done?

Visual Management & 5S



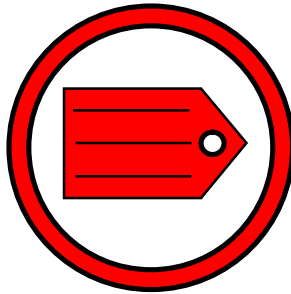
Visual Controls

- Notice / Communication Boards
- Up to date Performance Results (actual v Target)
- Health & safety – First Aid / Fire
- Demarcators – walkways / keep clear areas / trolley bays
- Standard Work Instructions



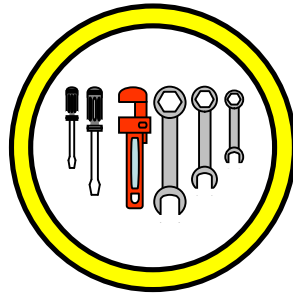
5S

Workplace Organization & Standardization



Sort

When in doubt, move it out – Red Tag technique



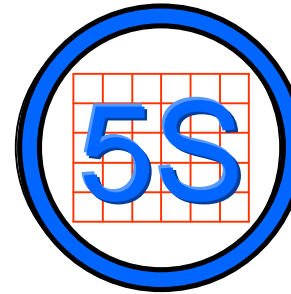
Set in Order

A place for everything and everything in its place



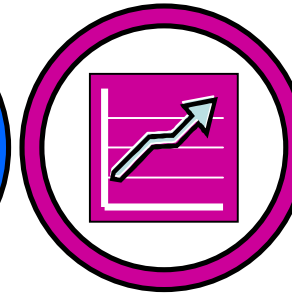
Shine

Clean and inspect or Inspect through cleaning



Standardize

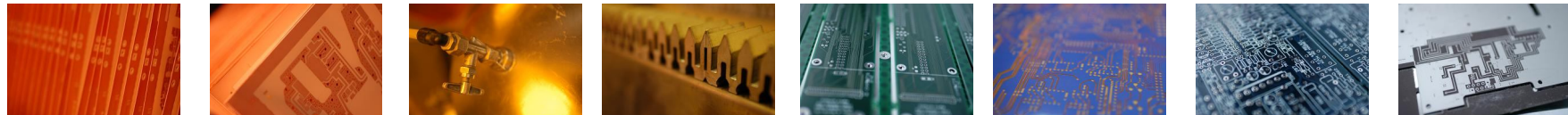
Make up the rules and follow them



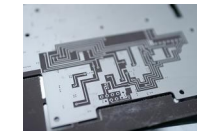
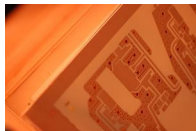
Sustain

Part of daily work and it becomes a habit

www.5SSupply.com



Importance of 5S



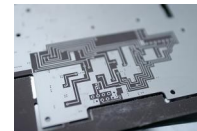
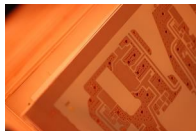
Sort

Separate the necessary from the unnecessary.

Identify what is required to work a process or perform a particular operation or task.

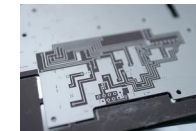
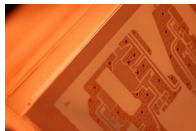
Remove unnecessary tools, equipment, files, binders, parts, procedures, furniture, and other 'stuff' from the area.

When in doubt, move it out !



5-S Red Tag Example

CELL/AREA	RED TAG		TAG NUMBER
CATEGORY (Check <input checked="" type="checkbox"/> one) <input type="checkbox"/> RAW MATERIAL <input type="checkbox"/> JIGS and TOOLS <input type="checkbox"/> OFFICE MATERIAL <input type="checkbox"/> WIP <input type="checkbox"/> MEASURING INSTRUMENTS <input type="checkbox"/> BOOKS/MAGAZINES <input type="checkbox"/> FINISH GOODS <input type="checkbox"/> EQUIPMENT <input type="checkbox"/> FINISH GOODS <input type="checkbox"/> FINISH GOODS <input type="checkbox"/> FURNITURE <input type="checkbox"/> OTHER			
TAG DATE: M/ ___ D/ ___ Y/ ___		TAGGED BY: _____	
CLASSIFICATION (Check <input checked="" type="checkbox"/> one) <input type="checkbox"/> RAW MATERIAL <input type="checkbox"/> INERT <input type="checkbox"/> HAZARDOUS <input type="checkbox"/> NONHAZARDOUS			
ITEM NAME: _____			
STOCK #:	FIXED ASSET CODE:	SERIAL #:	
UNIT QUANTITY:	VALUE:	\$	
REASON TAGGED (Check <input checked="" type="checkbox"/> one) <input type="checkbox"/> NOT NEEDED <input type="checkbox"/> SCRAP MATERIAL <input type="checkbox"/> DEFECTIVE <input type="checkbox"/> USE UNKNOWN <input type="checkbox"/> NOT NEEDED WITHIN THE NEXT 6 MO. <input type="checkbox"/> OTHER			
DISPOSITION BY: OPERATING UNIT _____		DEPT. _____	
DISPOSITION BY (Check <input checked="" type="checkbox"/> one) <input type="checkbox"/> DISCARD <input type="checkbox"/> MOVE TO SEPARATE STORAGE AREA <input type="checkbox"/> RETURN <input type="checkbox"/> OTHER <input type="checkbox"/> MOVE TO RED-TAG STORAGE AREA			DISPOSAL COMPLETE (signature) _____ DATE: M/ ___ D/ ___ Y/ ___
CELL/AREA	RED TAG LOCATOR		TAG #



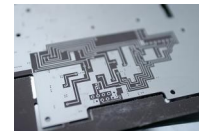
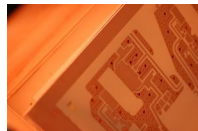
S *Set in Order*

Create a place for everything.

Organize materials according to frequency of use

Implement visual aids to improve communication

A place for everything and everything in place

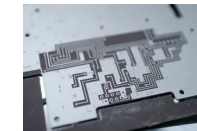
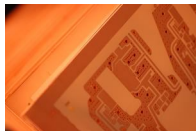


S Shine

Perform daily cleaning and inspection of area
To improve safety & prevent equipment breakdowns.

*A daily discipline to an agreed plan that
is carried out by the departmental team.*

A performance improvement discipline



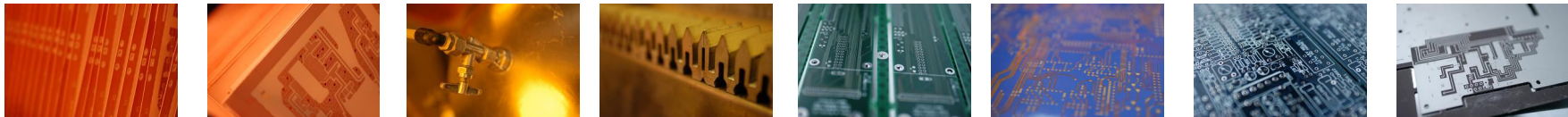
S Standardise

Work practices are consistent & standardised.

Standardization serves to minimize variation and the effect of variation on quality and speed.

We want to look towards standardization with process, Set up, methods, etc.

The standard becomes the baseline for further improvement

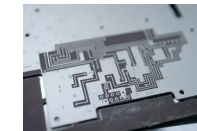
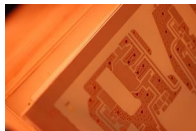


Sustain

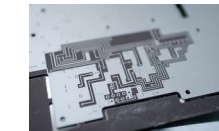
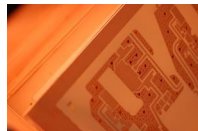
Keeping the gains and building further progress.
Do not allow a decline in standards

*The 'plan-do-check-act' thought process becomes the culture,
Along with 5S audits.*

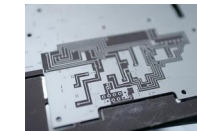
Pride in improvement, accomplishments, and the desire to do more



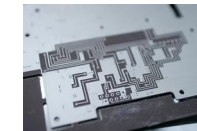
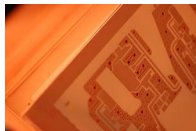
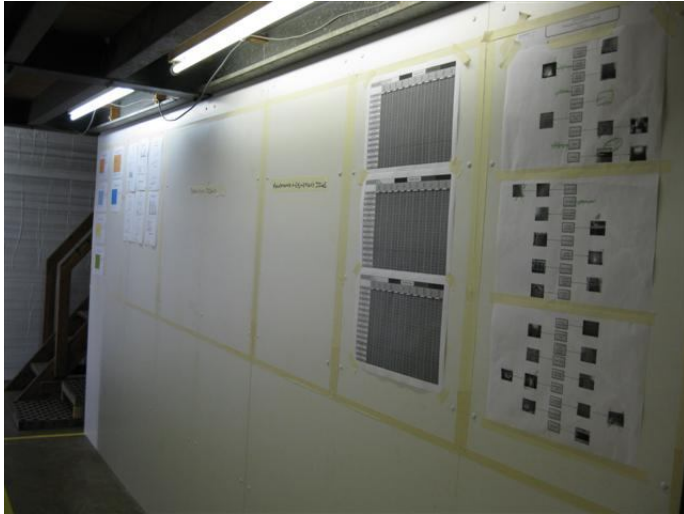
5S & Visual Management – Before & After



5S – Before & After



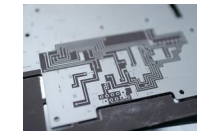
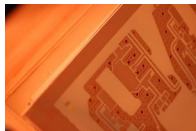
Visual Management



Monitoring & Measuring Lean

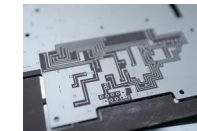
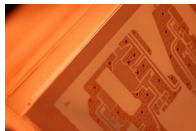
The effectiveness of LEAN is measured through KPI's

- On time delivery performance
- Customer complaint/returns
- Internal Yields (scrap & rework)
- Internal Remakes
- Short shipments
- Cycle Time (Internal Remakes
- **PROFIT £££**



Lean Future @ Spirit

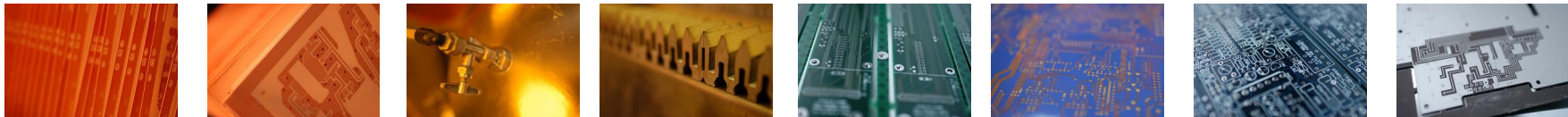
- Plan for next 18 months
- Continue 5s particularly “sustaining”
- Value Stream Mapping
- Set up Reduction
- Safe Operating Procedures
- Taking lean into front end processes (sales & Engineering)



Final Thoughts

Lean processes don't produce improved results.

It takes committed, engaged people, using lean processes to produce desired results.



Thank You

