



The Tonalli Group LLC

Manufacturing (Lean-JIT-BKM)

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Lean Manufacturing



- Endless Pursuit of Elimination of all Waste
- Waste is anything that adds cost but does not add value
- Goal is “PERFECTION”

Lean Manufacturing WARNINGS



- Never lay-off anyone as a result of lean improvements
 - Reduce workforce to expected requirements before beginning lean implementation
 - Subsequently, those whose jobs are reduced move to lean implementation roles
- Who's on Board?



Lean Manufacturing Tools & Methods



- Starting Point
 - Value Stream mapping
 - 5S
 - Rapid set-up and change over
- AVOID (Implement Later)
 - Kanban
 - Inventory reduction
- JIT & Single Part Flow

Lean Manufacturing

Step 1 (Current State)



■ Some Data Gathering

□ Process Flow


- Run rate
- Scrap rate
- Inventory level at each step
- Number of operators at each step
- Machine cycle time and change over time
- Equipment and materials vs. process flow

Lean Manufacturing

Step 2 ID Waste



- If customer is not willing to pay for it = WASTE
 - Seven types of waste
 - Overproduction/ Underproduction
 - Waiting
 - Unnecessary material transport
 - Over processing of parts
 - Inventory
 - Unnecessary movement
 - Defects



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Steps 3 What to do with Waste

- Creates Value
- Does not create value, but is required
- Does not create value, is not required
- Plan for future





Lean Manufacturing



- ***Pull System***
 - Request of Goods Triggers Production
- **Push System**
 - Produce to make the numbers
- **Desired Outcome**
 - Right product, at the right time, in the right quantity



Plant Layout



- Planning = Production Efficiency
- Cellular Layout Advantage
 - Single piece flow
 - Minimize WIP (Work In Process), Transportation, Storage Area
 - Easily adjust capacity by adding or removing workers
- Draw Diagram



Lean Manufacturing Metrics



- Machine Utilization
- Safety
- Quality
- Productivity
- Cost
- Scrap



Lean Methods

5 S

- Sort-Straighten Up
- Stabilize-Sequence-Synchronize
- Shine-Spic & Span
- Sustain-Self Discipline
- Standardize-Standardize





Lean Methods

5 S



- Employee morale improved if the workplace is clean and pleasant
- Setup time reduced if all tools, dies, jigs, etc. are in their proper places, clean, in good condition, and neatly arranged
- Defects will be more apparent in a clean plant
- Movement of material easier and safety improved if clutter is eliminated
- Waiting time decreased if parts are stored in proper locations. Material handling improved. Delivery performance improved.
- Unsafe conditions eliminated: improperly stacked materials, slippery floors, blocked vision, and sharp chips and objects on floors

ANALOGY-Cleaned and Organized Environment



- Having to clean force you put stuff away preferably in the right place.
- Stowing items in the right place forces organization for future look up of items.
- It also offers a visual check for out of the ordinary items that can be easily identified (worn machinery...).
- If you can't find a home, then it either belongs there and you have to clean it or you need to get rid of it.
- Visual is the key.



Wrap Up



- PULL SYSTEM
 - Customer Oriented/ Support Team
 - Field Installation- Visual aids
 - Production Schedule
 - Inventory Control
 - On-site
 - OFF-SITE
 - Delivery of Goods
 - Scrap
 - Cellular Layout
- 5 S
- Lean Agent
- Involve Entire Workforce