

# The Journey To Lean Manufacturing Success

## Design & Build Phases

To pilot the lean design and to refine and validate the concepts in a live setting

### Design Pilot Documents

**Executive Summary**

**LP11 Lean Configuration:**  
In this phase, we develop the cell and facility layout design, which in addition to configuring the layout, establish the material flow for lean manufacturing.

**Objectives:**

- Design new product line-oriented layout for the factory's primary material flow
- Reduce WIP
- Reduce movement distance and handling
- Reduce cycle time
- Reduce floor space
- Increase visual management

**Key Activities:**

- Review the material flow paths
- Group product families into work cells
- Develop work cell layouts

**Output:**

- High-level work cell layout
- High-level facility layout
- Defined material flow route

**CHOOSING THE PILOT**

**Pilot Selection Criteria**

The pilot phase of the Lean initiative will focus on activating one cell in the facility. Factors for the pilot are chosen or eliminated to:

- Provide a realistic example of Lean Operations

Factor	Weight	Rating	Notes
Production Volume	10	5	High volume, high priority
Product Complexity	10	4	Complex product, high priority
Customer Importance	10	5	High customer importance, high priority
Space Availability	10	3	Low space availability, low priority
Material Availability	10	4	Good material availability, medium priority
Operator Availability	10	5	High operator availability, high priority
Equipment Availability	10	4	Good equipment availability, medium priority
Energy Availability	10	5	High energy availability, high priority
Water Availability	10	5	High water availability, high priority
Compressed Air Availability	10	5	High compressed air availability, high priority
Gas Availability	10	5	High gas availability, high priority
Electricity Availability	10	5	High electricity availability, high priority
Telephone Availability	10	5	High telephone availability, high priority
Internet Availability	10	5	High internet availability, high priority
Security Availability	10	5	High security availability, high priority
Fire Safety Availability	10	5	High fire safety availability, high priority
Environmental Availability	10	5	High environmental availability, high priority
Regulatory Availability	10	5	High regulatory availability, high priority
Insurance Availability	10	5	High insurance availability, high priority
Legal Availability	10	5	High legal availability, high priority
Accounting Availability	10	5	High accounting availability, high priority
Human Resources Availability	10	5	High human resources availability, high priority
Information Systems Availability	10	5	High information systems availability, high priority
Facilities Availability	10	5	High facilities availability, high priority
Transportation Availability	10	5	High transportation availability, high priority
Utilities Availability	10	5	High utilities availability, high priority
Other Availability	10	5	High other availability, high priority

**PILOT**

Detailed pilot cell configuration ...

**Cell Layout**

**CAPABILITY TRANSFER**

Pilot activities involve implementation team members, both client and consultant, working side by side with shop floor associates and beginning to transfer Lean Operations knowledge and capabilities to the client organization



#### LEAN OPERATIONS THREADS

Project Management	Green
Flow	Green
Standards	Red
Culture	Red
Change Leadership	Yellow

### Develop Physical Systems

**MATERIAL STORAGE & RESUPPLY**

Define line-side storage quantities and locations, and develop standard material handling routes, times, and procedures

**Flow Racks**

**Ergonomic Presentation**

**KANBANS**

Develop production Kanbans for each finished good in the pilot cell, and withdrawal Kanbans for all raw materials required in the cell ...

**Sample Kanban Card**

... and develop instructions for working in the new Kanban system

**2 BIN System**

**Kanban Tree**

As possible, begin a supplier pilot to test delivery of raw materials to their point of use at lineside

### Standards

**QUALITY PILOT**

Elements of the quality program design are necessary parts of the pilot cell activation, though these elements can also be tested independently

**MAINTENANCE PILOT**

Lean maintenance practices support the pilot cell, but can also be tested separately ...

**STANDARDIZED WORK INSTRUCTIONS**

Develop standard work instructions, supplemented by visual aides, to support operators in the new cell

**VISUAL WORKPLACE**

### Information

**External Information Flow**

**Internal Information Flow**

**Information**

Improved Information Flow within Production

- Goal
  - Move ERP data as fast as material
  - Reduce number of transactions
  - Reduce manual effort
- Achieved by using repetitive and flow functionality
  - Modify BOM's and routing
  - Establish cell data collection
  - Allow cost and scrap reporting using repetitive backflush
- Produces results by
  - Eliminating all labor reporting transactions
  - Eliminating all WO setup activities
  - Eliminating WO package

### Training / Change Management

**JOB ROTATION**

**Job Rotation Chart**

Operator No.	1	2	3	4	5
8:00 - 10:00	A	B	C	D	E
10:00 - 12:00	E	A	B	C	D
1:00 - 3:00	D	E	A	B	C
3:00 - 5:00	C	D	E	A	B

**TRAINING**

**Training Needs Plan**

End User Training, Documentation Strategy & Analysis

**Training Topics**

- Full system
- OS
- One piece flow
- TPM
- SPC
- FIFO
- Self inspection
- Line stop
- Teamwork
- Team responsibilities

**Training Plan**

- Principle
- Skills required
- Gap
- Training schedule
- Training string

**Pilot Training Sample Agenda**

- Objectives or "why are we doing this?"
- Overview of the lean operations model for Cell 1
  - Material Flow
  - Information Flow
  - Production Scheduling
  - Kanban Cards
- Prepares for Production
  - Review morning jobs for die status and steel availability
  - Stage steel and die for next job
- Manage Kanban System
  - Place morning Safety Stock cards in Mailbox
  - Review mailbox for safety stock problems
  - Play safety stock problems to Production Scheduler - Issue Express Kanban if necessary
  - Ensure H/L drivers are following WIP Store procedures

**Pilot Training Sample**

- Schedule Press
  - Put morning Kanbans on Production Scheduling Board
  - Notify Production Scheduler upon receipt and prior to production of special requirement jobs
  - Coordinate production of Job Shop orders with Production Scheduler
  - Sequence jobs in "Top Row"
- Prepares for Production
  - Review morning jobs for die status and steel availability
  - Stage steel and die for next job
- Manage Kanban System
  - Place morning Safety Stock cards in Mailbox
  - Review mailbox for safety stock problems
  - Play safety stock problems to Production Scheduler - Issue Express Kanban if necessary
  - Ensure H/L drivers are following WIP Store procedures

### Active Pilot

**STARTING THE PILOT**

Begin with a 5S review to increase the likelihood of pilot success:

**The 5S's**

1. SEIRI (Sort) - Remove unnecessary items from the work area
2. SEITON (Set in Order) - Arrange necessary items in a logical and easy-to-find manner
3. SEISO (Shine) - Clean and maintain the work area
4. SEIKETSU (Standardize) - Establish standards for the work area
5. SHITSUKE (Sustain) - Maintain and improve the 5S

**PILOT RESULTS**

Visually track key performance measures ...

**Pilot Cell Performance**

**Throughput per Operator**

**Space Used (Sqft)**

**BULK PICKING PROGRESS CONTROL BOARD**