SESSION J

Using Lean Principles to Make Your Company Safer

Presentation by

Matin Karbassioon
Business Growth Consultant
CONNSTEP

CBIA 2019 Safety & Health Conference | May 17, 2019

Using Lean Principles to Make Your Company Safer

Matin Karbassioon
May 17, 2019

CONNSTEP
a CBIA affiliate

Purpose

- To provide means to integrate safety into Lean deployment and ensuring the health and safety of the organization while improving productivity

Key Learning Points

- Lean principles overview
- Definition and examples of eight wastes
- Integrating Safety and Lean

CONNSTEP
a CMEA affiliate

Lean Principles

- Understanding Value
  - Specified by the customer
- Identify the Value Stream
  - Eliminate non-value added steps
- Make the Value Stream Flow
- Let the Customer Pull the Product
- Strive for Perfection

CONNSTEP
a CMEA affiliate

Defining Lean

Lean is:

"A systematic approach to identifying and eliminating waste (non-value added activities) through continuous improvement by flowing the product or service at the pull of the customer in pursuit of perfection".

—The MEP Lean Network

CONNSTEP

Integrating Safety into Lean

"A systematic approach to identifying and eliminating waste" (*as well as activities that could cause injury or illnesses)* through continuous improvement by flowing the product or service at the pull of the customer in pursuit of perfection".

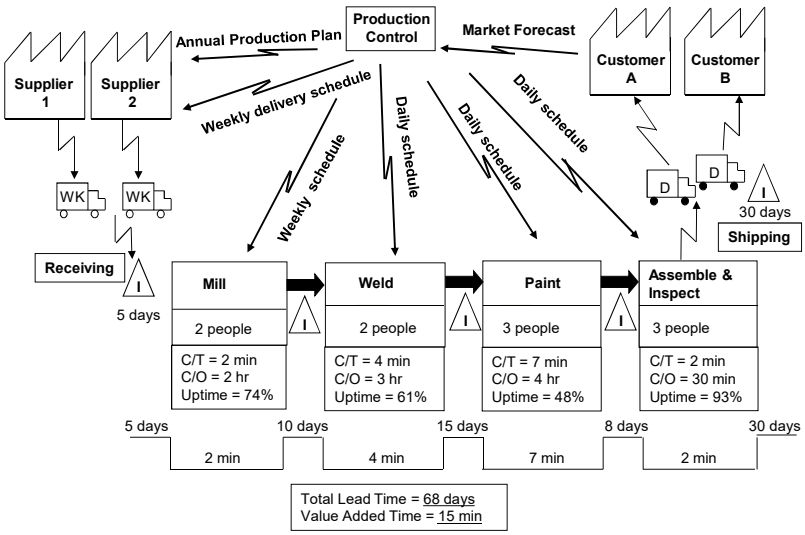
CONNSTEP

The "Lean" Process

- Map the current process
- Identify all areas of waste
- Brainstorm to develop ideas
- Identify opportunities for improvement
  Implement changes
- Measure the results and adjust
- Plan for continuous improvement

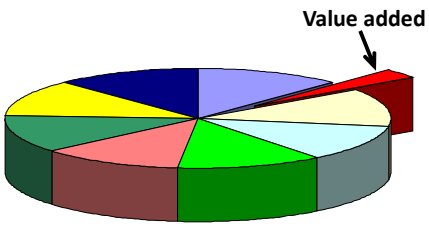
CONNSTEP

Current State Value Stream Map



CONNSTEP

Lean = Eliminating the Wastes



- Defects
- Overproduction
- Waiting
- Non-utilized people
- Transportation
- Inventory
- Motion
- Excess processing

Typically 95% of Total Lead Time is Non-value added!!!

CONNSTEP

The 8 Wastes

- The eight wastes are typically discussed in terms of process and productivity
- The inclusion of safety risks within the eight wastes may help gain support and expedite corrective actions

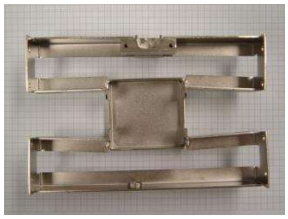
CONNSTEP

Waste of Defects

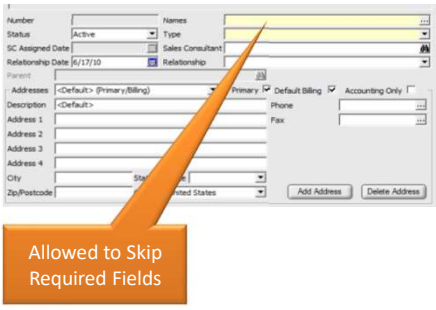
- Defective Materials (information)
- Causes of Defect
  - Weak process control
  - Poor quality
  - Unbalanced inventory level
  - Deficient planned maintenance
  - Inadequate education/trainings /work instructions
  - Product design
  - Customer needs not understood
  - Unclear procedures

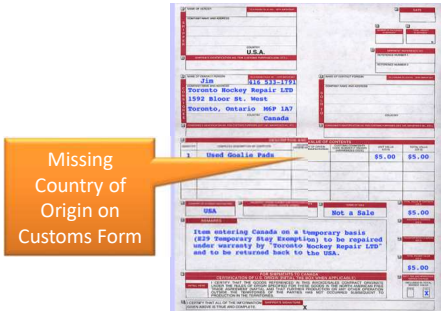
CONNSTEP
a CIMA affiliate

Defects



Defective Materials from Suppliers or Scrap/Rework produced by In-house Processes





CONNSTEP
a CIMA affiliate

Link to Safety

- Defect prevention requires less work and involves fewer injury exposures than defect discovery and repair
- High levels of defects may also signal poor housekeeping and/or lighting which may create other safety issues such as distraction and eye strain

CONNSTEP

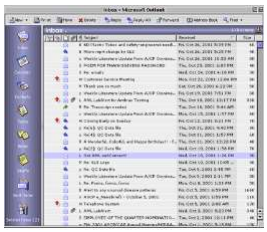
Waste of Overproduction

- Making **more** than is required by the next process
- Making **earlier** than is required by the next process
- Making **faster** than is required by the next process
- Causes of Overproduction Waste
  - Just-in-case logic
  - Misuse of automation
  - Long process set-up
  - Unleveled scheduling
  - Unbalanced work load
  - Over engineering
  - Redundant inspections
  - Confusing “data” for “information”

CONNSTEP

Overproduction




CONNSTEP
a CIMA affiliate

Link to Safety

- Overproduction indicates that workers may be working faster than needed by the next process, which can increase the risk of a repetitive strain injury
- Making more than is needed may also result in clutter and poor housekeeping and increased number of accidents
  - Balanced workload *based on customer demand rate (Takt Time)* reduces these risks and decreases the likelihood of increased Work in Process Inventory

CONNSTEP
a CIMA affiliate

Waste of Waiting

- Idle time created when waiting for…?
- Causes of Waiting Waste
  - Unbalanced work load
  - Unplanned maintenance
  - Long process set-up times
  - Misuses of automation
  - Upstream quality problems
  - Unleveled scheduling
  - Poor Housekeeping

CONNSTEP
a CMSA affiliate

Link to Safety

- Delays and time wasted due to poor material and information flow can impact employee motivation and increase the risk of falls and overexertion as workers rush to catch up

CONNSTEP
a CMSA affiliate

Waste of Non-utilized People

- The waste of not using people's (mental, creative, physical or skill) abilities
- Causes of People Waste
  - Old guard thinking, politics, the business culture
  - Poor hiring practices
  - Low or no investment in training
  - Low pay, high turn over strategy

CONNSTEP
a CIMA affiliate

Link to Safety

- Risk of complacency and loss of focus when performing monotonous tasks

CONNSTEP
a CIMA affiliate

Transportation

- The movement of information and materials around the office/factory
- Causes of transportation waste:
  - Poor office/factory layout
  - Poor understanding of the process flow
  - Excessive hand-offs
  - Too many e-mails
  - Excessive approvals
  - Large batch sizes, long lead times, and large storage areas

CONNSTEP

Transportation

Shipping documents are picked up by Billing 3-4 times daily

CONNSTEP

Link to Safety

- Excessive product movement increases exposure to material handling and industrial truck injuries

CONNSTEP
a CMSA affiliate

Waste of Excess Inventory

- Any supply in excess of a one-piece flow through a manufacturing or administrative process
- Causes of Inventory Waste
  - Protects the company from inefficiencies and unexpected problems
  - Product complexity
  - Unleveled scheduling
  - Poor market forecast
  - Unbalanced workload
  - Unreliable shipments by suppliers
  - Misunderstood communications
  - Reward system

CONNSTEP
a CMSA affiliate

Link to Safety

- Excess **Work in Process** between operations (*due to large lot production or processes with long cycle times)* impedes movement, increases the risk of trip hazards, distractions, blind spots for pedestrians and fork lifts as well as manual handling injuries
- Excess **Raw Material** inventory will result in temporary (often unsafe) storage locations creating obstacles to safe movement of employees

CONNSTEP
a CBIA affiliate

CONNSTEP
a CBIA affiliate

“We got a good price this month”

CONNSTEP
a CMSA affiliate

Waste of Motion

- Any movement of people or machines that does not add value to the product or service
- Causes of Motion Waste
  - Poor people/machine effectiveness
  - Inconsistent work methods
  - Unfavorable facility or cell layout
  - Poor workplace organization and housekeeping
  - Extra “busy” movements while waiting

CONNSTEP
a CMSA affiliate

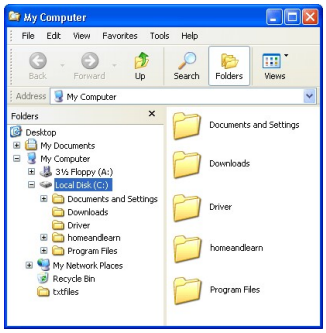
Link to Safety

- Unnecessary motions such as reaching over the head for a tool or searching for one, instead of having it within normal reaching distance, *at the point of use*, are both wasteful and hazardous

CONNSTEP

Motion

How long does it take to find what you need?



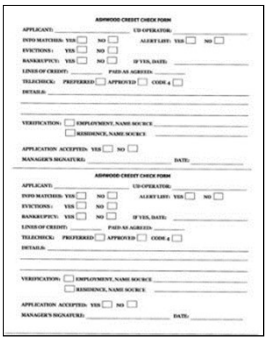
CONNSTEP

Waste of Excess Processing

- Effort that adds no value to the product or service from the customers' viewpoint
- Causes of Processing Waste
  - Product changes without process changes
  - Just-in-case logic
  - True customer requirements undefined
  - Over processing to accommodate downtime
  - Lack of communications
  - Redundant approvals
  - Extra copies/excessive information

CONNSTEP
a CHSA affiliate

Excess Processing



ASHWOOD CREDIT CHECK FORM

APPLICANT: _____ CSI OPERATOR: _____

INFO MATCHES: YES ☐ NO ☐ ALERT LIST: YES ☐ NO ☐

EVICTIONS: YES ☐ NO ☐

BANKRUPTCY: YES ☐ NO ☐ IF YES, DATE: _____

LINES OF CREDIT: _____ PAID AS AGREED: _____

TELECHECK: PREFERRED ☐ APPROVED ☐ CODE 4 ☐

DETAILS: _____

VERIFICATION: ☐ EMPLOYMENT, NAME SOURCE _____

☐ RESIDENCE, NAME SOURCE _____

APPLICATION ACCEPTED: YES ☐ NO ☐

MANAGER'S SIGNATURE: _____ DATE: _____

ASHWOOD CREDIT CHECK FORM

APPLICANT: _____ CSI OPERATOR: _____

INFO MATCHES: YES ☐ NO ☐ ALERT LIST: YES ☐ NO ☐

EVICTIONS: YES ☐ NO ☐

BANKRUPTCY: YES ☐ NO ☐ IF YES, DATE: _____

LINES OF CREDIT: _____ PAID AS AGREED: _____

TELECHECK: PREFERRED ☐ APPROVED ☐ CODE 4 ☐

DETAILS: _____

VERIFICATION: ☐ EMPLOYMENT, NAME SOURCE _____

☐ RESIDENCE, NAME SOURCE _____

APPLICATION ACCEPTED: YES ☐ NO ☐

MANAGER'S SIGNATURE: _____ DATE: _____

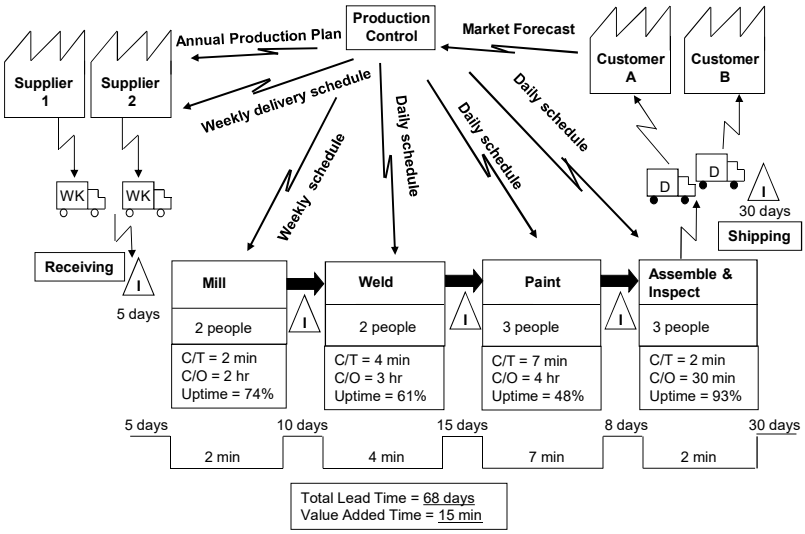
CONNSTEP
a CHSA affiliate

Link to Safety

- Inefficient work flow and extra processing steps such as avoidable reaching, twisting and material handling tasks increase overexertion risk
- Process steps that absolutely add no value to the product or service being provided may help increase EHS risks
  - Painting Cold Rolled Steel v. offering Stainless Steel
  - Degreasing parts twice

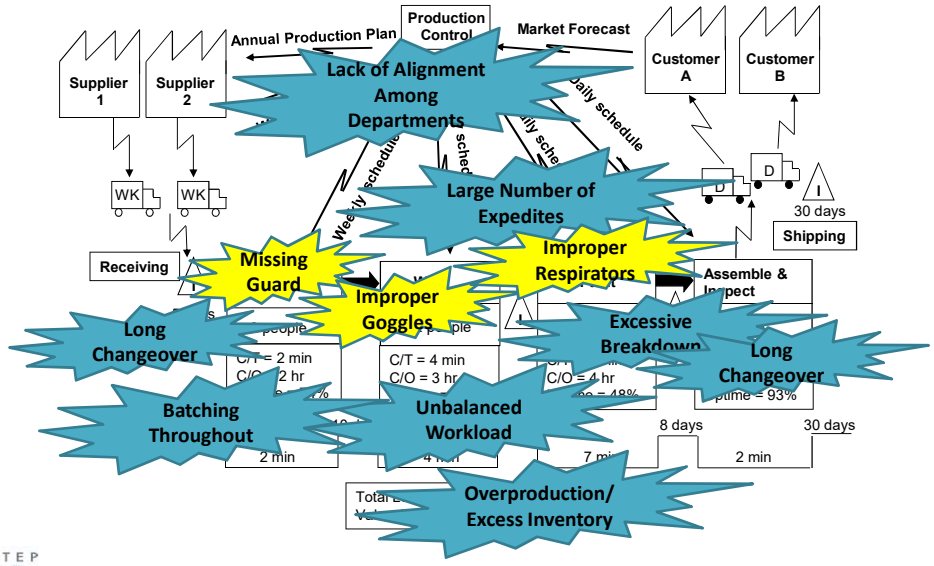
CONNSTEP

Current-State Value Stream Map



CONNSTEP

Current-State Value Stream Map



CONNSTEP

EHS (Green) Metrics

- Scrap/Non-product output
- Materials use
- Hazardous materials use
- Energy use
- Water use
- Air emissions
- Solid waste
- Hazardous waste
- Water pollution/wastewater

CONNSTEP

Effective Ways to Sustain an Organized and Standardized Workplace

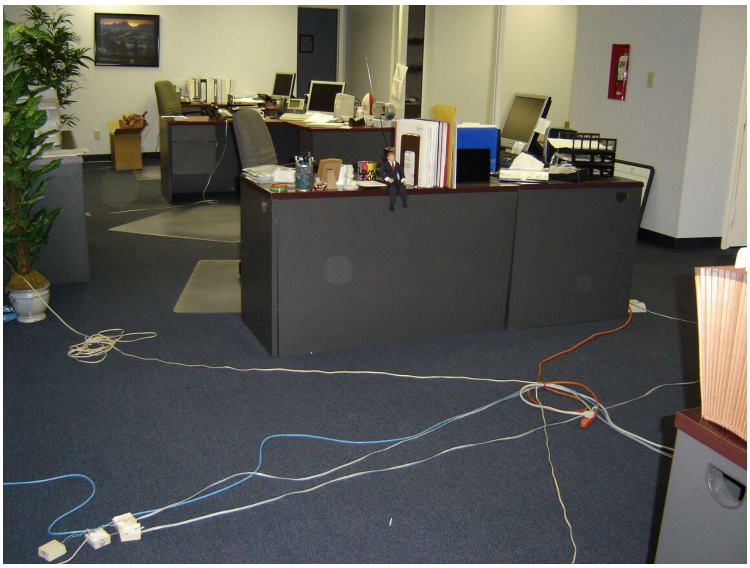
- Utilize visual checklists, standards and procedures
- Establish methods to continue compliance to standards and procedures
- Post Before and after photos/documentation
- Conduct Weekly/Monthly Audits
- Recognize and communicate good work

CONNSTEP

What's wrong here?

CONNSTEP

Or here?



CONNSTEP
a CIMA affiliate

Productivity improvements can often drive to unsafe work practices

Safety Interlocks Found Bypassed!

X	Basic Skill
O	Counter Measure
O	Accessibility
X	Safety
X	Mistake Proofing
O	Productivity

Operator pallet change station limit switch is found to be loose and bypassed!

Safety hazard:
Both machines were found with bypassed door interlocks!
Safety First!
Please verify that all interlocks are functioning.

CONNSTEP
a CIMA affiliate

Is this Chemical Hazardous?

Before

After

CONNSTEP

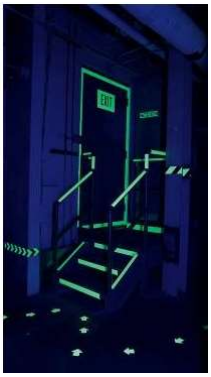
Which one is safer to operate?

Before

After

CONNSTEP

Safety



CONNSTEP
a CMA affiliate

Door Prize?

+

=

CONNSTEP
a CMA affiliate

Integrating Safety and Lean

- National studies show a strong correlation between high incident rates and Lean implementations where strong safety programs are not present

Integrating Safety and Lean

- Raises the levels of employee participation and awareness and results in
  - Safer working conditions
  - Reduced lost time
  - Decreased costs of accidents

CONNSTEP
a CIMA affiliate

Final Thoughts

- Project sponsors and leaders must emphasize safety in their project charter
- Project teams must put safety above Lean in any process improvement initiative
- Project teams must mitigate safety risks using the Plan, Do, Check, Act problem solving methodology and by addressing them as top priority action items

CONNSTEP
a CIMA affiliate