Managing a Lean Seaport

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Where Did “Lean” Come From?

The Toyota Production System by Taiichi Ohno

The Machine That Changed the World and Lean Thinking by Jim Womack and Dan Jones
All we try to do is “reduce the timeline from the moment a customer places an order to the point the customer receives what they want (and the company collects cash) by removing non-value-added activities (or waste)” – Taiichi Ohno, The Toyota Production System

Lean Enterprise Objective

- Satisfy the Customer by...
  - Reduce Cost
  - Improve Quality
  - Compress Time
To increase port capacity without significant investment in new resources, me must:

- **Flow** material through at a faster rate
  - Unload more efficiently when it arrives
  - Manage material more efficiently while we store it
  - Load more efficiently when it departs
Every process has wastes…the key lies in seeing it.

**Total Lead Time**

**Value Adding Activity**

Absolute minimum activities which must be done to produce customer requirements:

*Things that customers pay for*

**Non-Value Adding Activity**

Any resources like labor, space, materials spent in the manufacturing process that customer has no requirements for:

*Things that customers do not pay for*

Typically 95% of **Total Lead Time** is Non-Value Added!
8 Deadly Wastes

- Defects
- Overproduction
- Waiting
- Not Utilizing People’s KSAs
- Transportation
- Inventory
- Motion
- Excess Processing
UAH Lean Enterprise for Port Operations

Continuous Improvement Culture

Teamwork

Customer Focus (TAKT)

Kaizen

Workplace Optimization

Workplace Analysis

Workplace Organization

Quality @ The Source

TPM

Layout

SMED Principles

Standardized Work

5s System

POUS

Visual Workplace

Value Stream Mapping
Kaizen and Lean

Kaizen is the vehicle of implementation for Lean tools

- Cross-functional team
- Focused scope, aggressive goal
- Eliminates wastes in a short amount of time at a minimal cost
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
  - Clear organizational vision, mission, and values
  - Link continuous improvement to overall business objectives
- Establish a corporate Lean Steering Committee to champion efforts
- Invest in Lean training at all levels
- Practice Value Stream Management and Map Value Streams
- Schedule improvements (kaizen!) based on implementation plan
Key Elements of Strategic Planning

- **Values**
  - What are the key factors that drive our organization’s culture, priorities, and decisions?
  - Ex: profitability, employee development, environmental responsibility, respect, etc.

- **Vision**
  - How we desire our organization and/or the world in which we operate to exist
  - Ex: A global world with full access to all resources for a quality life

- **Mission Statement**
  - States the purpose of the organization, defines the customers, and defines specific value or uniqueness of the organization
  - Ex: To be the premier import coal terminal on the Gulf Coast, supplying coal to power plants across the Southeast through world-class operations and exceptional customer service

- **Identify value streams that will accomplish the mission**
  - What group(s) of processes create value for our customers?
  - Ex: Imports, Exports, Maintenance
Toyota’s Management System – The PDCA Cycle

- Standard management process that drives down to ALL levels of the organization

- Time allocation:
  - Plan – 70%
  - Do – 10%
  - Check – 10%
  - Act/Adjust – 10%
  - How do you typically spend your time?

- The “DO” at one level triggers the “PLAN” for the next lowest level
PDCA - Strategic Level

Plan
- Vision
- Mission
- Values

Do
Value Streams
- Imports
- Exports
- Etc.

Act/Adjust
- Business Dev.
- HR Dev.
- Process Improvement

Check
Strategic Metrics
- Financial
- Quality
- Safety
- Morale
PDCA- Operational Level

Strategic Level

Operational/Value Stream Level

Plan

Value Stream Map
- Current State
- Future State
- Implementation Plan

Do

Improvements
- Go-do
- Kaizen Event
- Projects

Act/Adjust

Manage VSM Plan
- Hold reviews
- Update Future State Map

Check

Operational Metrics
- Dwell Time
- Truck turn time
- Lifts/hour
- Defect %
Strategic Level

PDCA- Process Level

Process Level

Plan
Grasp Situation
- Project scope
- Process observation tools
- Data collection

Do
Implement Tools
- SMED Principles
- Workplace org/5S
- TPM
- Etc

Act/Adjust
Standardize
- Document and train on new standard

Check
Improvement Metrics
- Monitor operational metrics after implementation
- Visual graphs

Operational/Value Stream Level

Plan
Value Stream Map
- Current State
- Future State
- Implementation Plan

Do
Improvements
- Go-do
- Kaizen Event
- Projects

Act/Adjust
Manage VSM Plan
- Hold reviews
- Update Future State Map

Check
Operational Metrics
- Dwell Time
- Truck turn time
- Lifts/hour
- Defect %

Act/Adjust
- Business Dev.
- HR Dev.
- Continuous Improvement

Check
Strategic Metrics
- Financial
- Quality
- Safety
- Morale

Plan
- Vision
- Mission
- Values

Do
- Value Streams
- Imports
- Exports
- Etc.
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
- Establish a corporate Lean Steering Committee to champion efforts
  - Identify value streams
  - Establish appropriate performance metrics
  - Identify training needs
- Invest in Lean training at all levels
- Practice Value Stream Management and Map Value Streams
- Schedule improvements (kaizen!) based on implementation plan
Responsibilities of Steering Committee

- Develop and communicate a vision and strategy
- Identify who our customers are (importers, exporters, ship owners, ship operators, etc.)
- Identify and support Value Streams and Value Streams Managers
- Communicate a sense of urgency
- Establish standards and sustain improvements
- Recognize and reward
- Celebrate the successes
- Continue until it is culture
Lean Organizational Chart

Management Steering Committee

Lean Champion

Value Stream Manager

Team Members

Value Stream Manager

Team Members

Value Stream Manager

Team Members
Roles of Steering Committee

PLAN
- Develop and communicate a vision, mission, and strategy
- Identify our customers
- Identify and support Value Streams and Value Stream managers
- Training: Management, Facilitators/Lean Leaders, Employees

DO
- Identify opportunities and estimate savings at a strategic level

CHECK
- Develop metrics & tracking system
- Identify person(s) responsible for tracking, managing & reporting

ACT
- Be engaged and foster a continuous improvement culture
- Hold structured periodic reviews to guide future improvements and strategies based on previous results and projected developments
- Recognize and reward
Roles of Lean Champion

PLAN
- Participate in Steering Committee meetings
- Scope and schedule improvement activities (value stream mapping, kaizen events, etc.)

DO
- House and coordinate resources for Lean training
- Facilitate and support improvement activities
- Measure results

CHECK
- Work with value stream managers to manage improvement activity follow-up actions
- Ensure appropriate metrics are collected and reported
- Monitor improvement activity results

ACT
- Hold meetings with value stream managers to ensure sustainment of improvement standards
- Report back to Steering Committee
Roles of Value Stream Managers

PLAN
- Participate in Steering Committee meetings
- Work with Lean Champion to scope and schedule improvement activities (value stream mapping, kaizen events, etc.)

DO
- Map current and future state value stream map annually
- Manage value stream implementation plan
- Identify training needs within value stream
- Be engaged and support all improvement activities for the value stream

CHECK
- Work with Lean Champion to manage improvement activity follow-up actions
- Collect appropriate metrics
- Hold follow-up reviews for each action on the value stream implementation plan
- Ensure improvements, new standards and procedures are being followed

ACT
- Update value stream map based on results of improvement activities
- Hold meetings with Lean Champion to ensure sustainment of improvement standards
- Report back to Steering Committee
Measuring Port Performance

• Measuring port performance is necessary for the CHECK phase of the PDCA cycle

• Without proper performance measures and data, we cannot understand our standard and how we are performing against that standard
  • Determine the metrics needed to measure improvement
  • Determine how you document and report the results
  • Make sure that the operators/supervisors understand and know how to use the new metrics
Organizational/Transformation Metrics

Customer Focused:
- Customer satisfaction
- Turnaround times
- Quality

Operational:
- Ship/Truck turnaround time
- Container dwell time
- Crane productivity (lifts per available hour)
- Yard productivity (moves per hour)
- Cost/ton of cargo
- Defect rates
- Overall equipment effectiveness (OEE)

Employee Focused:
- Morale
- Safety
- Flexibility
- Cross-trained employees
- Accidents
- Implemented suggestions
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
- Establish a corporate Lean Steering Committee to champion efforts
- Invest in Lean training at all levels
  - Learn to “see” waste
  - Establishes an organization of problem-solvers
- Practice Value Stream Management and Map Value Streams
- Schedule improvements (kaizen!) based on implementation plan
Training: To Drive the PDCA Cycle at all Levels of the Organization

- Upper Management and Support Functions
  - Lean awareness training
  - Roles and characteristics of a Lean organizational culture

- Lean Champion and Value Stream Managers
  - Practitioner-level training on application of tools
  - Problem-solving and leadership
  - Project management

- Team Leaders/Supervisors
  - Lean Concepts overview
  - Job methods improvement training
  - 4-step Job Instruction (how to train others to do jobs)

- Operators
  - Waste identification
  - Lean Concepts overview
Training allows us to:

• Align focus and common language
• Establish standards of what normal operating conditions look like
• Learn to see waste
• Create an organizational community of problem-solvers
• Use continuous improvement tools to eliminate waste
• Develop and train on new standards
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
- Establish a corporate Lean Steering Committee to champion efforts
- Invest in Lean training at all levels
- Practice Value Stream Management and Map Value Streams
  - Current state
  - Future state
  - Implementation plan
- Schedule improvements (kaizen!) based on implementation plan

Value Stream Management

Executive Management Involvement

- Integrate Lean Enterprise into strategic planning
- Establish Lean Steering Committee
- Invest in Lean Enterprise training at all levels of the organization
- Practice Value Stream Management
- Choose a pilot area and get started!
A value stream is…

- ALL the activities that create value
- Starts with cargo arrival, raw materials or initial information
- Ends with the end customer/user
Value Stream Mapping Components

- Determine the organization’s value streams, then for each:
  - Understand how the operation currently works (identify waste)
  - Design for a lean value flow
  - Develop a detailed roadmap of how to get there!
For each identified Value Stream

For each identified Value Stream

Understanding how the operations currently operate:

- Determine the material and information flows
- Using icons, capture the current conditions as a “snap shot” in time
- Remember that we are only looking at a 30,000 ft view! Don’t get bogged down in the weeds!
- Go see the process with your own eyes!
- The goal is to accurately represent what happens and to LEARN TO SEE WASTE
- This becomes the foundation of the future state
Current State Data

- **Customers**
  - How much do they want?
  - When and how often do they want it?
  - How do they want it delivered?

- **Processes (anything that helps us understand what is happening)**
  - Cycle times (lifts/hr, tons/hr, lifts/man hr, etc.)
  - Number of operators and shifts
  - Equipment reliability
  - Quality/defect rate

- **Suppliers**
  - How much do we order/request?
  - How and how often do they deliver?

- **Information**
  - How do customers place orders?
  - How do we order from our suppliers?
  - How do people on the yard know what to do?
  - How do we know our status?
Designing a lean flow

- You **always** need a future state
- Design the material (cargo) flow first
- Develop the information flow to support the material (cargo) flow
- Begin by drawing on Current State
- Design for a feasible management timeframe (approximately 12-18 months down the road)
Future State Questions

1. At what velocity do we need to flow cargo to meet customer demand?

2. Where in our processes are there wastes and disruptions in the flow of cargo?

3. What countermeasures can eliminate or reduce the wastes and disruptions of flow of cargo?

4. What would our operation look like if these countermeasures were in place?
1. At what velocity should we flow cargo?

Individual Efficiency vs. System Efficiency
2. Where is the Waste?

- Defects
- Overproduction
- Waiting
- Not Utilizing People’s KSAs
- Transportation
- Inventory
- Motion
- Excess Processing

Remember…we create the current state in order to **SEE WASTE!!**

- Brainstorm existing waste
  - What activities add no value?
  - Where are there disruptions in the flow of value?
Waste of Defects
Waste of Overproduction
Waste of Waiting
Waste of Not Using People’s KSAs
Waste of Transportation
Waste of Inventory
Waste of Motion
Waste of Excess Processing
3. What Countermeasures are needed to address waste?

- Waste is really a symptom rather than a root cause of the problem.

- Waste points to problems within the system (at both process & value-stream levels).

- We need to find and address root causes of waste.
5-Why: Root Cause Analysis

5 has been determined, as a rule of thumb, as the number at which most root causes are clearly identified

- not always necessary to reach 5 before the root cause of a problem is fully explained
- it may take more than 5 why’s to get to the bottom of it

Ask the full question including the problem or cause behind it.

- If there is a problem with cargo locations misidentified, ask:
  - “why are cargo locations misidentified?”
- If the answer is “inaccurate information in the computer system,” ask:
  - “why is the computer system information inaccurate:

If we do not follow this approach, answers to the “why’s” tend to lose focus on the 3rd or 4th “why”
Problem: Increase in defective containers

**WHY** has there been an increase in defective containers?

- A: Containers are being damaged during the ship unload process

  **WHY** are containers being damaged during the ship unload process?
  - A: Containers are being set down off-center on the bomb cart

    **WHY** are containers being set down off-center?
    - A: Bomb carts are not positioned correctly

      **WHY** are bomb carts not positioned correctly?
      - A: Trucks are either pulling too far up or not far enough

      **WHY** are trucks pulling up too far or not far enough?
      - A: Truck drivers aren’t paying attention

The “root cause” points responsibility to someone else

The “root cause” can’t be corrected
Effective Root Cause Analysis

Problem: Increase in defective containers

WHY has there been an increase in defective containers?
↓ A: Containers are being damaged during the ship unload process

WHY are containers being damaged during the ship unload process?
↓ A: Containers are being set down off-center on the bomb cart

WHY are containers being set down off-center?
↓ A: Bomb carts are not positioned correctly

WHY are bomb carts not positioned correctly?
↓ A: Trucks are either pulling too far up or not far enough

WHY are trucks pulling up too far or not far enough?
↓ A: No visual indicator/error-proofing to assure alignment

- We can correct the root cause
- A solution was implementable!
UAH Lean Enterprise for Port Operations

Continuous Improvement Culture

Kaizen

Teamwork

Customer Focus (TAKT)

Workplace Optimization

Quality @ The Source

TPM

Workplace Analysis

Layout

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Standardized Work

Workplace Organization

5s System

POUS

Visual Workplace

Value Stream Mapping
Typical Lean Countermeasures

- Information (Operational Awareness)
  - Visual scheduling
  - Visual track and monitor real-time performance metrics

- Inefficient Process (long cycle times, changeovers, low productivity, etc.)
  - Workplace Organization (5S)
  - SMED Principles
  - Standardized work procedures
  - Layout for flow

- Defects, mistakes, poor quality
  - Standardized work procedures
  - Job instruction training
  - Error proofing

- Equipment Downtime
  - Total Productive Maintenance program (TPM)
  - Workplace organization (5S)
  - Track Overall Equipment Effectiveness (OEE)
Workplace Organization
Tools

- **5S**— (Sort, Set-in-Order, Shine, Standardize, Sustain)
  - A safe, clean, neat, arrangement of the workplace provides a specific location for everything, and eliminates anything not required

- **Point-of-Use-Storage (POUS)**
  - Locate items necessary to perform job activities where they are used (Tools, materials, supplies, equipment, and information)

- **Visual Workplace**
  - Simple, self-explanatory signals that give immediate and accurate understanding of a situation or condition
Tools and Equipment at the Point of Use

Tools and equipment located exactly where needed
Visual Workplace

Color-coding cargo by destination

Clearly marked yard locations
Visual Communication

Shift Communication Board

Next Tow Gulf blend
4 IN Tow

Ship unloading status

Average Tons per day last ship: 37,892
Goal: 35,000
SMED Principles: Internal vs. External Steps

Internal:
- Ship arrives
- Checked by Customs
- Open hatch doors
- Position Cranes
- Flop Gates & Start Conveyors
- Start Unloading

External:
- Open hatch doors
- Position Cranes
- Flop Gates & Start Conveyors

Time (Min): 15 30 45 60 75 90
Truck Loading Procedures

8. When loading is complete do a load check verifying correct product was loaded, load is tight and can be transported safely, loaded in proper order to minimize customer movement. Note: on Roll tight trailers roll canopy from front to back ensuring there are no obstructions interfering with carousel movement.

9. Sign paperwork, turn in to office, and pick up next assignment.
8. Call loaders to send coal

Note: Keep coal out of the bow corners

Begin placing coal between the 6th & 7th rib

Position chute to place coal in the center of the barge

9. Load coal until the bottom of the pile builds up to the weld line on the wall of the barge (Note: Keep coal out of the corners of the bow)

10. Once the first pile is the correct height move the barge north keeping the pile consistent height (Note: Monitor barge list and correct as needed by positioning chute in shore/out shore)

Weld line on barge

Load barge keeping a consistent pile height
Training on standardized work to improve quality

4-Step Job Instruction

1. Prepare the trainee
2. Demonstrate the job - main steps, key points, reasons why
3. Trainee performs job explaining - main steps, key points, reasons why
4. Feedback and evaluation
3. What is the measurement at the arrow?
- a. 2 1/2
- b. 2 5/8
- c. 2 3/4
- d. 2 11/16

4. If bar Y moves left at a constant speed, how does bar X move?
- a. Faster than Y
- b. Same speed as Y
- c. Slower than Y

5. Which container holds more?
- a. Container A
- b. Container B
- c. Equal
Quality at the Source

■ Improving process quality—(mistake-proofing)

Guides to simplify pick-up of containers
Improving process quality— (mistake-proofing)
TPM is a company wide equipment maintenance program that permanently improves the overall effectiveness of equipment with the active involvement of all employees.

Goal is to eliminate/minimize downtime due to breakdown maintenance and to maintain machines at peak performance.
Typical conditions:

- There is often a run-to-failure mentality
- Breakdowns occur regularly
- Temporary repairs are the norm
- Minor stoppages occur frequently
- Processing speed decreases
- No one is accountable for tracking these losses
- Operator training may not be adequate
**Overall Equipment Effectiveness**

OEE is a metric to:
- Immediately indicate the current status of your equipment
- Allow you to understand the effect of the various equipment issues, not just breakdowns, and how they affect the entire process

**OEE = Availability × Performance Efficiency × Rate of Quality**

<table>
<thead>
<tr>
<th>Availability</th>
<th>Performance Efficiency</th>
<th>Rate of Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>When or how often do you lose total availability of your equipment?</td>
<td>Does your equipment start and stop a lot?</td>
<td>Do you manufacture quality products?</td>
</tr>
<tr>
<td>How long are your set-ups?</td>
<td>Does your equipment run at 100% of its designed speed?</td>
<td>Are your processes repeatable?</td>
</tr>
<tr>
<td>Does your equipment break down frequently?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. How will our operations look with countermeasures in place?

**Current State**

<table>
<thead>
<tr>
<th>Load Barge</th>
<th>Future State</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 operators</td>
<td>3 operators</td>
</tr>
<tr>
<td>CT = 2 hours</td>
<td>CT = 1 hours</td>
</tr>
<tr>
<td>Survey = 20 min</td>
<td>Survey = 0 min</td>
</tr>
<tr>
<td>Reliability = 95%</td>
<td>Reliability = 100%</td>
</tr>
<tr>
<td>Defects = 10%</td>
<td>Defects = 0%</td>
</tr>
<tr>
<td>3 Shifts</td>
<td>3 Shifts</td>
</tr>
</tbody>
</table>

**Future State**

- Develop SOP for barge loading
- SMED survey performed on tug boat
- Visual communication board
- Collect OEE and implement TPM
- Job instruction training on new SOP to prevent listing and sinking defects

- Load Barge
  - 3 operators
  - CT = 1 hours
  - Survey = 0 min (performed externally)
  - Reliability = 100%
  - Defects = 0%
  - 3 Shifts
Import Bulk Material Future State Value Stream

**Importing Suppliers**
- 1 Every 3 Days
- 10 / Month
- Average 75k Tons

**Bulk Division**

**Unloading Ship**
- 4 operators
- CT = 2 days
- Reliability = 100%
- Cap = 35k tons/day
- 3 shifts

**Stack Coal**
- 1 operator
- CT = 2 days
- C/O = 5 min
- Reliability = 100%
- 3 shifts

**Reclaim Coal**
- 1 operator
- CT = 1 hour/barge
- C/O = 5 min
- Reliability = 100%
- Cap = 1500 ton/hr
- 3 shifts

**Load Barge**
- 3 operators
- CT = 1 hour
- Survey = 0 min
- Reliability = 100%
- Defects = 0%
- 3 shifts

**Surveyor**
- 50 Barges/day
- Avg. 1500 Tons per Barge

**Customers**

**Import Bulk Material Future State Value Stream**

**Monthly Coal Flow meeting**

**Vessel Info**

**Supervisor Meeting**
**Visual Schedule**

**Emails Forecast**

**Phone orders**

**Monthly Coal Flow meeting**

**Importing Suppliers**

1 Every 3 Days
10 / Month
Average 75k Tons

**Berth Ship**
- CT = 1 hour

**Customs**

**Immigration**

**Agriculture**

**Unload Ship**
- CT = 2 days
- Reliability = 100%
- Cap = 35k tons/day
- 3 shifts

**Stack Coal**
- CT = 2 days
- C/O = 5 min
- Reliability = 100%
- 3 shifts

**Reclaim Coal**
- CT = 1 hour/barge
- C/O = 5 min
- Reliability = 100%
- Cap = 1500 ton/hr
- 3 shifts

**Load Barge**
- CT = 1 hour
- Survey = 0 min
- Reliability = 100%
- Defects = 0%
- 3 shifts

225K Tons

**Lead Time = 7.12 days**
A Plan to Get There

IMPLEMENTATION:

• Don’t Wait! Make a VS Plan: What to do, by who, by when

• Tie it to business objectives/strategic plan

• Break Future State into phases

• VS Manager must manage to the plan
## Value Stream Implementation Plan

<table>
<thead>
<tr>
<th>Date</th>
<th>VS Manager</th>
<th>Value Stream Objectives</th>
<th>Type of Activity</th>
<th>Monthly Implementation Schedule</th>
<th>Signatures</th>
<th>Person In Charge</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>4/27/11</td>
<td>Tammy</td>
<td>Develop an appointment system for truck delivery and receiving</td>
<td>Project</td>
<td>Q2 11</td>
<td></td>
<td>Linda</td>
<td>10/31/11</td>
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<tr>
<td></td>
<td></td>
<td>Develop new layout and SOP for decking</td>
<td>Kaizen Event</td>
<td>Q3 11</td>
<td></td>
<td>Kenny, Kent, Bill</td>
<td>5/31/11</td>
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<tr>
<td></td>
<td></td>
<td>Develop ship unloading SOP</td>
<td>Kaizen Event</td>
<td>Q4 11</td>
<td></td>
<td>Eric</td>
<td>6/30/11</td>
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<tr>
<td></td>
<td></td>
<td>Develop SOP to improve truck turn times</td>
<td>Kaizen Event</td>
<td>Q1 12</td>
<td></td>
<td>Kent</td>
<td>8/31/11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investigate EDI improvements &amp; new technology</td>
<td>Project</td>
<td>Q2 12</td>
<td></td>
<td>Kwang, Ralph</td>
<td>7/31/11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- live update of BIT</td>
<td>Project</td>
<td>Q3 13</td>
<td></td>
<td>Kwang, Ralph</td>
<td>7/31/11</td>
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<tr>
<td></td>
<td></td>
<td>- live update of FHWA inspection dates</td>
<td>Project</td>
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<td></td>
<td>Eric, Joe</td>
<td>5/31/11</td>
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<tr>
<td></td>
<td></td>
<td>Improve equipment utilization</td>
<td>Go Do</td>
<td></td>
<td></td>
<td>Eric, Joe</td>
<td>5/31/11</td>
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<tr>
<td></td>
<td></td>
<td>- pooling top handlers</td>
<td>Go Do</td>
<td></td>
<td></td>
<td>Marvin, Kenny, Ray</td>
<td>9/30/11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- hot swapping UTR's</td>
<td>Project</td>
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<td>Marco, Kenny, Ray</td>
<td>9/30/11</td>
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<td></td>
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<td>Investigate shift start/stop times and extended break times</td>
<td>Project</td>
<td></td>
<td></td>
<td>Kwang</td>
<td>9/30/11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Investigate new procedures/location for increased container X-rays and develop new SOP</td>
<td>Project / Kaizen Event</td>
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<td></td>
<td>Joe, Linda</td>
<td>5/31/12</td>
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<td></td>
<td></td>
<td>Investigate upgrading hardware &amp; software for container handling equipment to improve inventory accuracy</td>
<td>Project</td>
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<td></td>
<td>Sean, Patrick</td>
<td>5/31/12</td>
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<tr>
<td></td>
<td></td>
<td>Investigate installing additional amp plugs</td>
<td>Project</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Develop and implement a TPM program</td>
<td>Project</td>
<td></td>
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</tr>
</tbody>
</table>
Implementation

Pencil AND Eraser!

- Go-do
- Kaizen
- Projects
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
- Establish a corporate Lean Steering Committee to champion efforts
- Invest in Lean training at all levels
- Practice Value Stream Management and Map Value Streams
- Schedule improvements (kaizen!) based on implementation plan
  - Go-do actions
  - Kaizen blitz events
  - Projects
  - Manage to the implementation plan!
Value Stream Mapping Review

- Value stream manager must hold reviews and monitor progress
- Update the Future State Map based on results
- Elevate issues and make decisions on data and facts
- If you do not manage to the plan, the plan is useless

<table>
<thead>
<tr>
<th>Loop</th>
<th>Objective &amp; Measurable</th>
<th>Progress</th>
<th>Evaluation</th>
<th>Remaining Issues/Problems</th>
<th>Comments/Ideas on Future Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Decrease barge loading time by 50%</td>
<td>Kaizen event on May 3- went from 2 hrs to 1 hr 20 min</td>
<td>Partial success-- reduced by 33%</td>
<td>Can load if barge in 53 min if new standardized procedure is followed, need more training and foreman attention</td>
<td>Implement visual cross-training and metric system to monitor use of standardized procedure</td>
</tr>
</tbody>
</table>
Path to Becoming a Lean Port

- Integrate Lean Enterprise into strategic planning
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- Schedule improvements (kaizen!) based on the Value Stream implementation plan