



Lean Transformation

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**This session is eligible for
1 Continuing Education and 1 Contact Hour.**

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- Attend 90% of this presentation
- Fill out the online evaluation for this session: www.necanet.org/2017Seattle

Agenda

- State of the Market
- How to Implement
- Case Studies
- Expected Results

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State of the Market



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Global Competition

- Better
- Faster
- Cheaper
- Higher quality
- Safer

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Industry Trends

- Pricing Pressure
- Schedule Compression
- Manpower Shortages
- Increasing Project Complexity

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Necessity of Innovation

- Trends are not going away
- Trends are accelerating
- Impact of aging industry
- Only industry without significant productivity gains

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A Vision for the Future

- 100% Kitting strategy
- 100% Increase in available workforce (women)
- Control over cost and schedule
- Managing up to the General Contractor and Owner

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Value Stream Mapping

- There are four enterprise level value stream maps in business:
 1. Recruit to Retire
 2. Concept to Launch
 3. Buy to Pay
 4. Order to Cash

The 5-3-1

KNOW 5

FIX 3

FOCUS 1



Roles & Responsibilities

Execute - actually does the work
 Participate - consulted or informed during the task or when completed
 Accountable - makes sure the work is complete and signed-off

Process	Sub Process	Task	E	P	A	Concst	Role	Group													MI		
								Customer/CM/EC	Sub Contractor	Parser	Utility	Inspector / Signer / AMI	Trumble Operator	Safety	Purchasing	Info Tech	Warehouse Manager	Post Manager	Facilities/Equipment Manager	Legal		Controller	Field Personnel/Operators
								E	2	1	1	0	0	1	2	7	1	2	1	8	1	1	8
								P	27	12	18	4	2	1	9	20	0	2	1	2	1	1	6
								A	0	0	0	0	0	1	3	2	0	0	1	2	0	1	0
								Total	29	13	19	4	3	3	13	29	1	4	3	7	2	3	0
								Sum	130														
Process	Sub Process	Task	E	P	A	Concst	Role														MI		
		Receive ITB by Email	1	4	0	0	EPPPP	E															
		Perform Go/No Go Decision	4	1	0	0	PEEP																
		Define Estimate Deadline	3	2	0	0	PEEP																
		Evaluate capacity to perform estimate	3	2	0	0	PEEP																
		Obtain Bid Documents	3	0	0	0	EE																
		Download Drawings	3	0	0	0	EE																
		Download Specification	3	0	0	0	EE																
		Reply to ITB (Yes/No)	4	0	0	0	EEEE																
		Pull a P Number	3	1	0	0	PEEP																
	Receive ITB	Set up Bid in Accubid	2	0	0	0	EE																
		Review Scope	3	0	0	0	EE																
		Perform Job Walk thru	3	0	0	0	EE																
		Identify costly items not clear in Scope	3	0	0	0	EE																
	Scope Review	Identify Power Company and Permit charges	3	0	0	0	EE																
		Designate Estimate Lead	2	0	0	0	EE																
		Assign tasks to produce Estimate	2	1	0	0	PEE																

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1) "Process Navigator" reference for current and new employees
 2) Analysis of R&R data... no "A", no "E", etc.
 3) More than 1 "A"



Enterprise Level Scheduling

- Most of the schedules reflect primarily the construction activities, not necessarily the upstream activities of:
 - Design
 - Detailing
 - Procurement
 - Manufacturing
 - Logistics

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Design Standardization

- Design teams need to be tasked with establishing product standards
 - Does not mean only one
 - Can be a standard for each application
 - Schools
 - Hospitals
 - Commercial Buildings
 - Etc.

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Manufacturing Standardization

Standardize Work Instruction Sheet							Area: Pre-Fab			
Process Name: Station 2		Takt Time 155	Cycle Time 46.0	% Loaded 83.6%	Created By: Michael	Creation Date: 27-Mar-14	Revision Date:			
KEY:	IN PROCESS STOCK ●	KEY SAFETY / ERGID +	DELTA CRITICAL ▼	QUALITY CHECK ◆	7 Types of Waste					
STPA	ELEMENT STEPS	KEY	Opt.	Time	Value or Non-Value	Waste Type	T-Transportation I-Inventory	M-Motion W-Waiting	OC - Over-processing OD - Over-production	D - Defects
1	Obtain information pertaining to job			8.0	N	OC				
2	Set-up stat. material to ea. location	●		10.0	N	OC				
3	Set pipe in appropriate location			2.0	N	M				
4	Obtain all pipe & materials			1.0	N	M				
5	Remove packaging			2.0	N	OC				
6	Position and install carrier assembly			10.0	V					
7	Install water, waste and vent	◆		11.0	V					
8	Index Carrier Assembly to Station 3	●		2.0	N	M				
9										
10										
11										
12										
13										
14										
15										
16										
17										
= Build Assist associated with step		Total Element Cycle Time = 46.0			Std Work Sheet ISO #	Sign-off / Initials				
						1st	2nd	3rd		

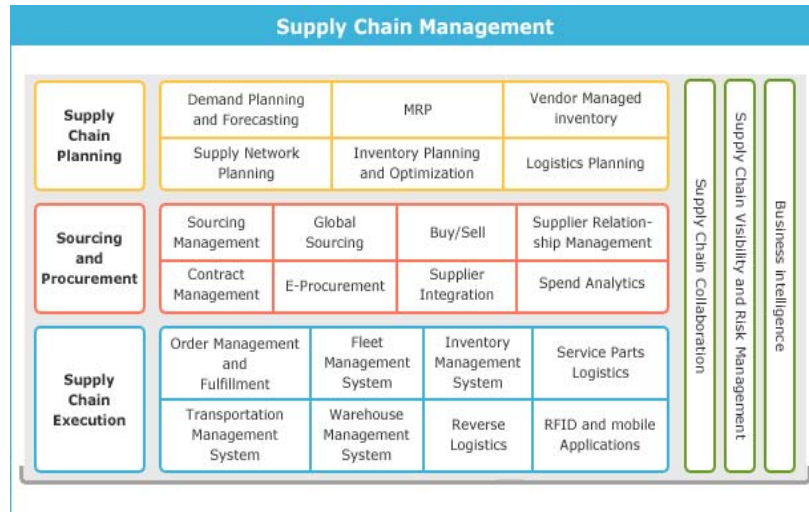


Installation Standardization

- Kits should be packaged with the first items needed on the top and the last items needed on the bottom.
- The field installation standards ensure the integrity of the kit.
- The installation standards should be developed by the field staff and should consider installation constraints.



Supply Chain Management



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Facility and Equipment Planning

- Items to consider include:
 - Material handling/forklift roadways and directions
 - Material flow/FIFO (First In, First Out)
 - Safety
 - Docking – enough space for staging and movability
 - Defined work cells
 - Pull manufacturing – work flows in one direction, not back and forth

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Training & Development

- By establishing standards, they can be:
 - Documented
 - Trained to
 - Tested for aptitude
 - Reinforced on an on-going basis

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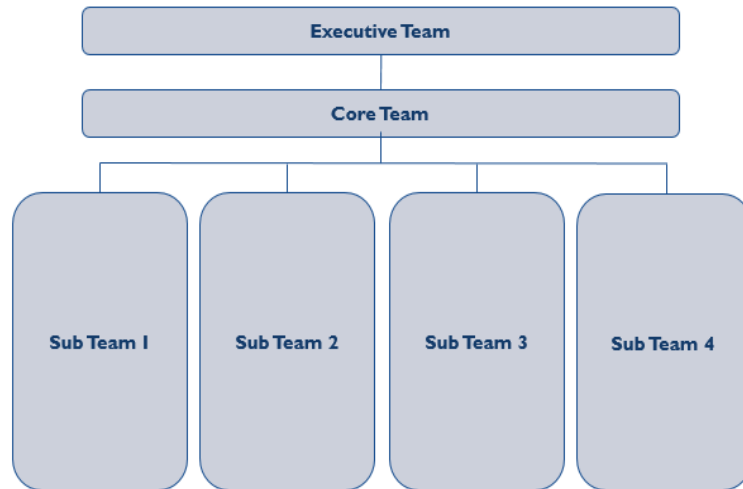
Workplace Organization (5s)

- **Sort** Elimination of all unnecessary items or equipment from the workplace to include items that are only used occasionally.
- **Straighten** Establish a functional layout for tools, equipment and material so that everything required for the job is readily available.
- **Shine** Removing all dirt, grease and grime from the workplace; Inspecting for defects and maintaining optimum conditions.
- **Standardize** Establish standards for maintaining a clean and trouble free workplace.
- **Sustain** Create a work environment where the rules and standards that everyone has established is the natural thing to do.

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Recommended Governance Structure



Construction Centric Contractor

- Construction Centric Company
- Special Projects Centric Company
- Service Centric Company

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Expected Results



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Expected Results

1. Cost Savings

- Labor Productivity
 - Design
 - Manufacture
 - Install
- Material Purchasing
 - Procurement at company level versus the job level

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Expected Results (cont.)

2. Safety
3. Quality
4. Schedule
5. Customer Satisfaction
6. Scalability of Business

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Thank you! Questions?



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Don't forget...

- 9:00 am – 1:00 pm – NECA Show
- 1:15 pm – 2:30 pm – Closing General Session with Ben Saunders
- 7:15 pm – Closing Celebration – Huey Lewis and the News

