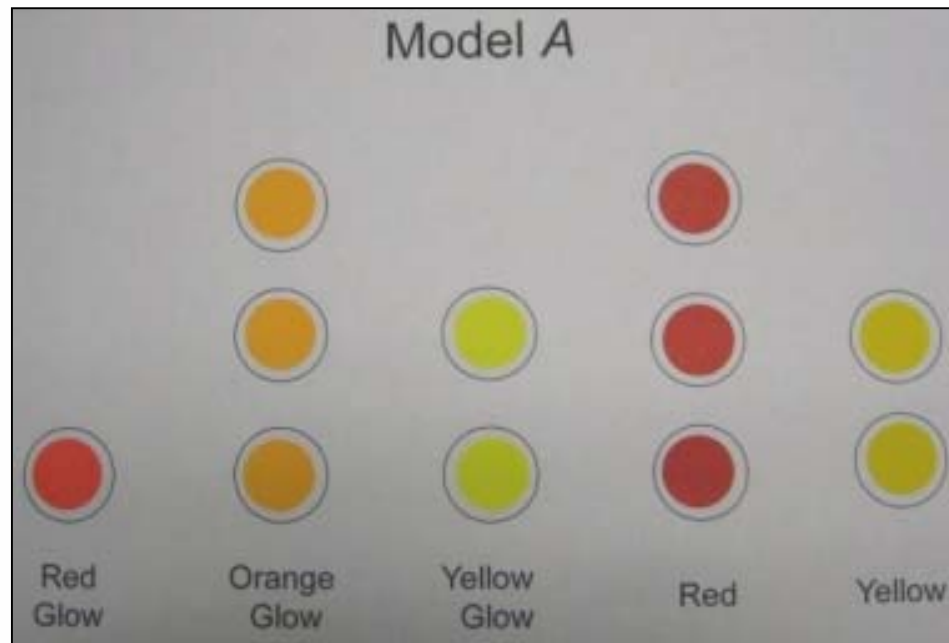
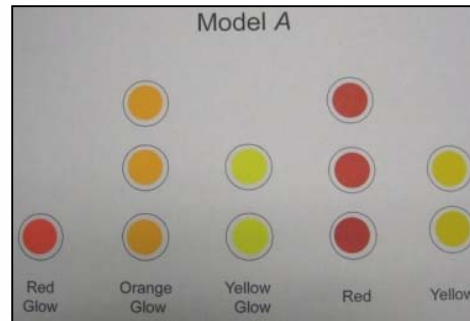


Spot Dot

Service and Manufacturing Business



Lean Six Sigma Project



Spot Dot Simulation

Manufacturing Examples

- Missed Deliveries Reduces Sales
- Excess Inventory
- Low Yield Increases Operating Cost
- Excess Defects Increases Inventory
- Low Operating Capacity Hurts Sales

Administrative Examples

- Slow Customer Invoice Processing Hurts Cash Flow
- Invoice Defects Delays AR and Hurts Cash Flow
- Slow Order Processing Hurts Sales
- Raw Material Inventory Costs Too High
 - Low purchasing agent capacity

Applies to Both Manufacturing and Service Businesses



Spot Dot Metrics

Metric	Baseline	Final	Comments
Available time	10	10	Minutes
# workers	9	4	
Time to 1st Del	3:04	0:45	Minutes
# Units produced	14	42	Finished Goods
Rework	11	0	
Scrap	16	3	
WIP	148	4	Work in Process
Productivity	0.16	1.05	= (Finished Goods/ (Workers*Available
Defects PPM	533333	66667	= (1,000,000*Scrap/ (Scrap+Finished Goods))

Dramatic Improvements in Productivity (>500%) and Quality (>800%)



THE NEW EXCELLENCE

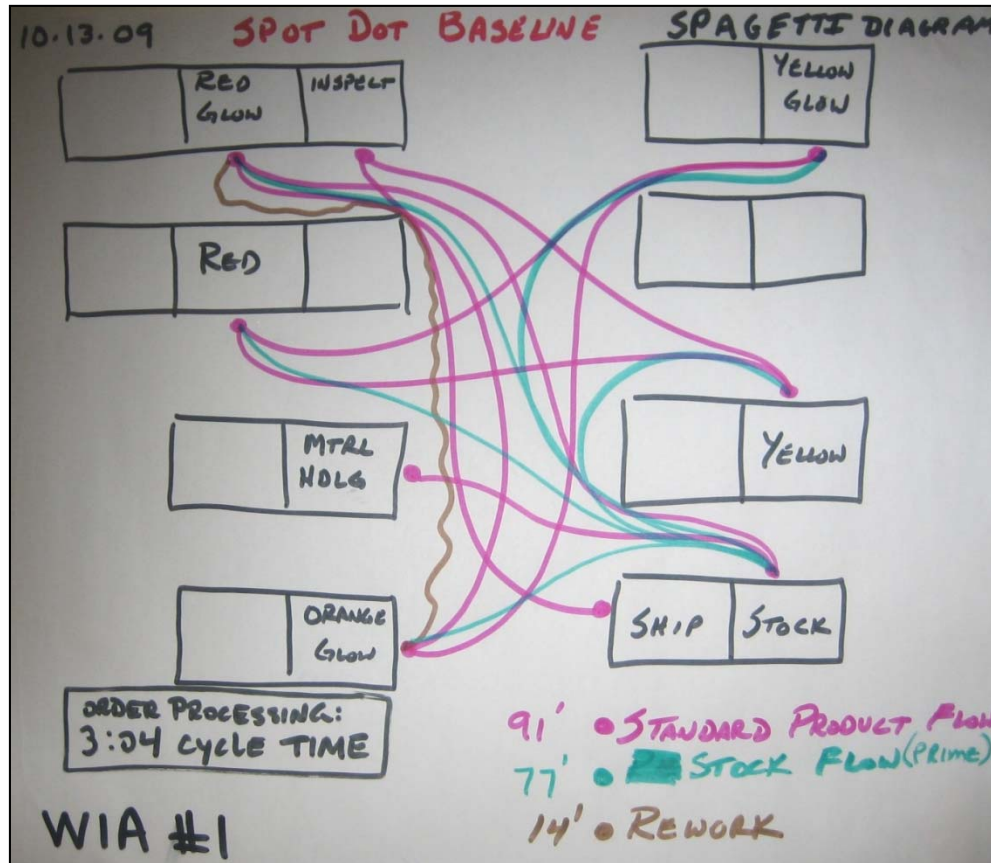
Spot Dot Team



Lean Students Improving the Process

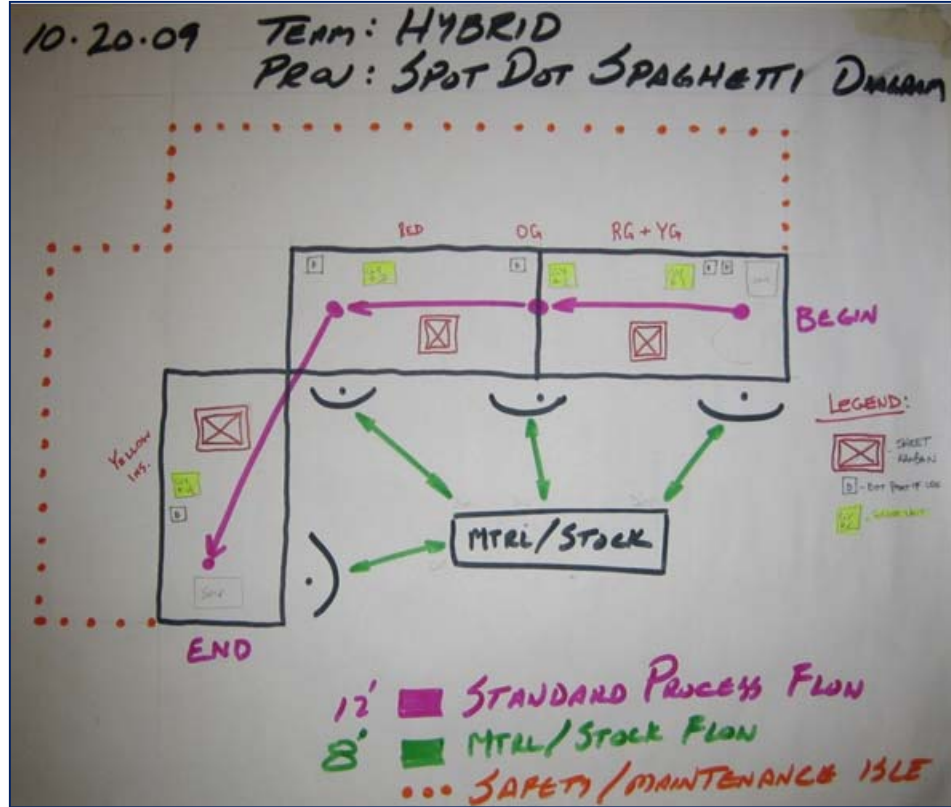


Baseline Physical Flow (Spaghetti) Map



Baseline Measurement = 91' of Product Travel Distance

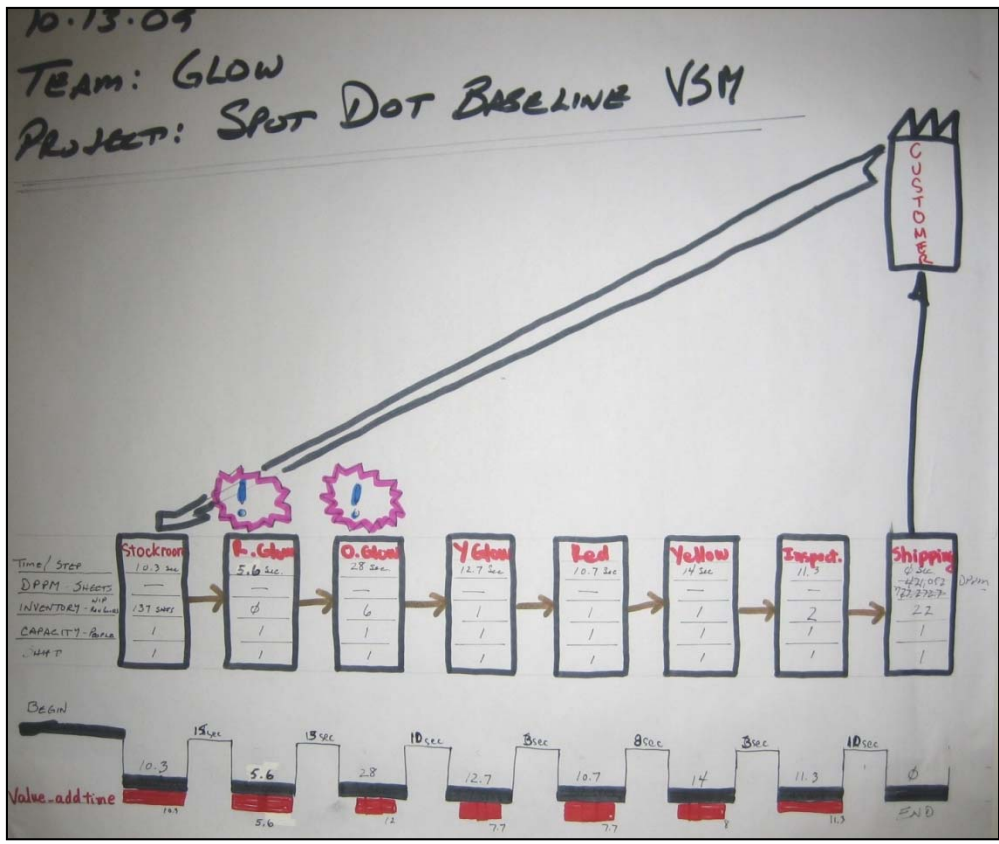
Final Physical Process Flow (Spaghetti) Map



Reduced Product Travel Distance from 91' to 12'



Value Stream Map



Baseline Map Reveals Product Lots of Non-Value Add Time



5 S

10-21-09 TEAM: SPOT ON!
PROV: 5-5

5-S CHECKLIST

CREW:
ROB N.
GUY B.
CARL C.

Sample 5-S Checklist - Office Date: 10/20/09

5-S Inspection	Item	Evaluation			Comments
		S	B	G	
Sort	Distinguish between what is needed and not needed There is no excess of what requires attention There is no duplicate of unused reference mat in the area There is no extra, broken or broken down supplies The files and papers are organized There is no production material in the cube	✓	✓	✓	26
Storage	A place for everything and everything in its place Is everything in its specified place? Items are stored in appropriate containers Items are in appropriate amount Items & labels are identified	✓	✓	✓	26 Items trucks up to 2nd floor
Shine	Cleaning and labeling for safety to keep it clean Control of flow of dirt & trash The surfaces are free of oil, fingerprints Control of sources of dirt & debris Floors are clean and free of debris Trash cans are emptied daily	NA	✓	✓	26 Low uncleaned gaps at floor Lunch yes recycle no
Maintenance	Check standards review and maintained Items are appropriately labeled Equipment labels are clear The areas are free of safety hazards and fireable items identified	✓	✓	✓	26 26 26
Sustain	Stick to the rules and follow up Check everyone observe standard procedures? Is everyone responsible with the responsibility? Is there an area 5S being posted?	✓	✓	✓	26 26 26

5-S RADAR CHART

PRIORITIES

Sort - ELIMINATE DUPLICATE ITEMS
Storage - LABEL STORAGE AREAS
Shine - LABELS!
Sustain - MAINTAIN CLEAN SCHEDULE

Need to Stabilize the Process Before Improving



THE NEW EXCELLENCE

Reduce Risk Using FMEA

DATE: 10.15.09
 TEAM: LEAN
 PROJ: PROCESS FMEA

SCALE 1, 3, 9

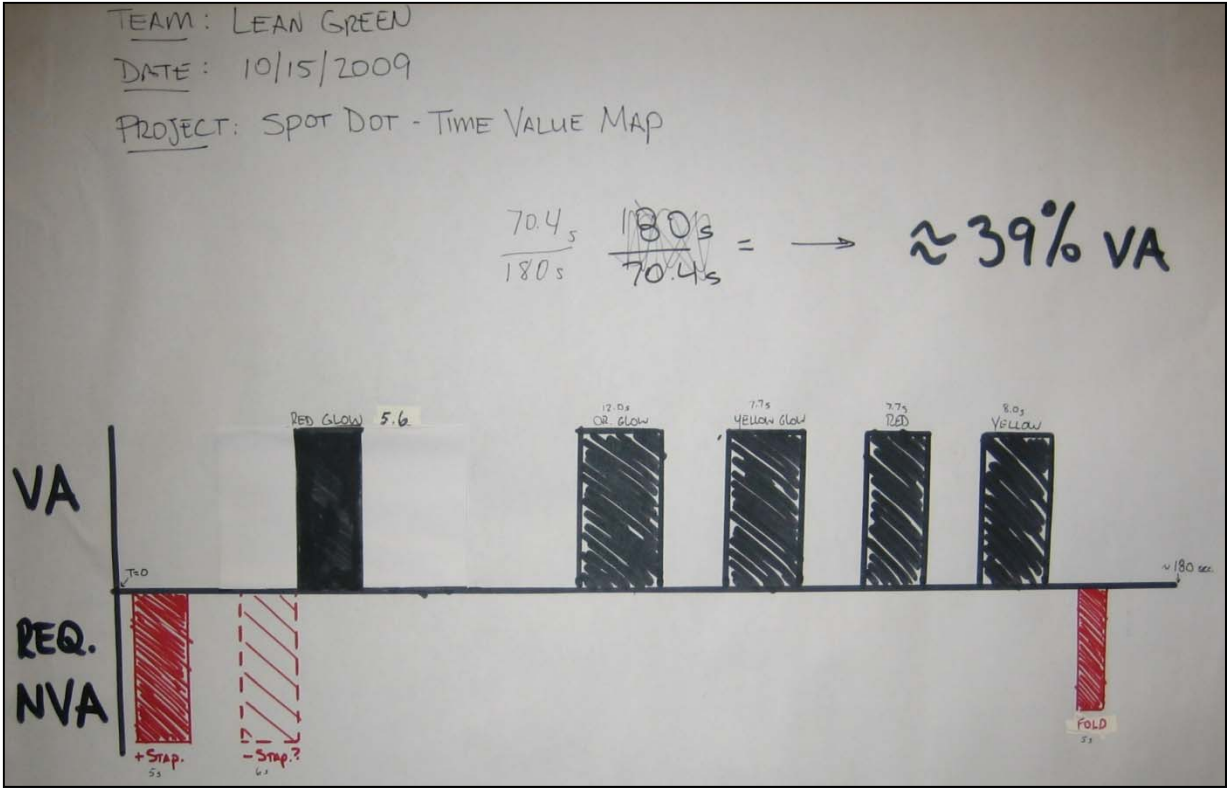
	MODE	EFFECT	S E V	CAUSES	N D O	CONTROLS	D E T	R P R N	ACTIONS	OWNER/DATE
STOCK ROOM	• QTY ERROR • STACK ERROR	WASTE QTY PROCESSES	1	Human	1	VISUAL	9	9	---	
		WASTE QTY PROCESSES	1	Human	1	VISUAL	9	9		
MATERIAL HANDLING	• HANDLING	MATERIAL DAMAGE	9	Human	1	VISUAL	1	9	---	
		DELIVERY	9	Human	3		1	27		
RED GLW	• STRIKE X • DOT (1)	MATERIAL DAMAGE	9	Human	1	VISUAL	1	9	Die / TEMPLATE (Process)	G09 / 10.21.09
		↑ CYCLE TIME DELIVERY	3		3		1	3		
ORANGE GLW	• DOT (3)	C-Time DELIVERY	3	Human	9	VISUAL	1	27	}	G09 / 10.21.09
			9		3		1	27		
YELLOW GLW	• DOT (2)	C-Time DELIVERY	3	Human	3	VISUAL	1	9	}	G09 / 10.21.09
			9		3		1	27		
RED	• DOT (3)	C-Time DELIVERY	3	Human	3	VISUAL	1	9	}	G09 / 10.21.09
			9		3		1	27		
YELLOW	• DOT (2)	C-Time DELIVERY	3	Human	3	VISUAL	1	9	}	G09 / 10.21.09
			9		3		1	27		
INSPECT	ESCAPE	BAD DELIVERY	9	Human	1	VISUAL	9	81	Die / TEMPLATE (INSPECTION)	G09 / 10.21.09
SHIPPING	QUANTITY - WANG	BAD DELIVERY	9	Human	3	VISUAL	3	81	SLOTTED RACK	G09 / 10.21.09

CREATED: 10.15.09 Colwell
 REV. DATE:

Actions Assigned to Reduce Specific Risks



Baseline Time Value Map



Baseline Process Has Only 39% Value Add to the Customer



Baseline Multi-cycle Analysis of Operators

10.14.09
 TEAM: **GLOW**
 PROJECT: MULTI-CYCLE ANALYSIS OF SPOT DOTS, ROUND #1

T.CYCLE #	TYPE	KEEP?	OPERATION DESCRIPTION	CYCLE			PREDICTED SLOWEST	
				1	2	3		
1	PW		STOCK ROOM	START FINISH TO COMPLET	8 14 9	10.3	3.2	16.7
2	V		RED GLOW	T. TO COM	5 5 8 5 3	5.6	.3	6.2
3	V		ORANGE GLOW	T. TO COM	13 9 14	12	2.6	17.2
4	V		YELLOW GL.	T. TO COM	9 6 8	7.7	1.5	10.7
5	V		RED	T. TO COM	15 4 4	7.7	6.4	20.5 ⁺²
6	V		YELLOW	T. TO COM	8 9 7	8	1	10
7	PW		INSP. & FOLDING	T. TO COM	15 7 12	11.3	4	19.3 ⁺³
8	PW		SHIPPING	T. TO COM	0 0 0	0	0	0

LEGEND: PW - Pure Waste, V - Value Added, Avg - Average, SD - Standard Deviation

Baseline Shows Red and Inspection Operators Have High Cycle Times (20.5 sec & 19.3 sec)



Improved Process Multi-Cycle Analysis

TEAM: COLO
PROJECT: SPOT DOT #2
10-16-09

Task	Type	Keep	Operation Description	Queue Time	Cycle Time			Average Cycle Time	Std. Deviation	Predicted Slowest	Avg + 2σ
					#1	#2	#3				
1	PW		Stock Room	0	8	14	9	10.3	3.2	22	16.7
2	PW		Material Handling	12	8	12	6	8.7	3.1	3	14.9
3	V		Red Glow	8	5.5	5.8	5.3	5.6	.3	21	6.2
4	V	TBD	Orange Glow	2	8.6	7.6	7.4	7.9	0.6	7	9.1
5	V		Yellow Glow	15	9	8	7	8.0	1.0		10.0
6	V		Red	7	5	4	4	4.3	0.6		5.5
7	V		Yellow	3	5	5	5	5.0	0.0		5.0
8	PW		Inspection	0	8	10	10	9.3	1.2		11.7
9	PW		Shipping	0	0	0	0	0.0	0.0		0

LEGEND
PW - Pure Waste
V - Value Add
TBD - To Be Determined

Red and Inspection Operators
Show Improvement in Cycle Time (from 20.5 to 5.5 sec & from 19.3 to 11.7 sec)



Takt Time

DEMAND: 50 SH/10 min

$$\frac{10 \text{ min} \times 60 \text{ sec/min}}{50 \text{ SH}} = \frac{600 \text{ SEC}}{50 \text{ SH/min}}$$

= 12 SEC/SHEET

Pace of Production Calculated to Meet Customer Demand



Standard Work

10/19/09 TEAM: G.O.F. + 1
PROJECT: SPOT DOT ROUND 3
STANDARD WORK

OPERATOR	STEP	TASK	MANUAL	WALK	AUTO
A	1	YELLOW - GO TO STOCK CAGE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	2	STOCK EACH STATION W/DOTS (1 DAY)			
	3	RETURN TO STATION - PLACE DOT ON PAGE			
B	1	YELLOW Glow/RA - GO TO STOCK CAGE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	2	PLACE PAPER AT "START"			
	3	RETURN TO STATION PLACE DOTS/PAGE TO OP			
C	1	OG PLACE DOTS - PASS TO RED	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
D	1	RED - PLACE DOTS - PASS TO YELLOW	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
A	4	YELLOW - INSPECT PAGE	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	5	PLACE DOTS ON PAGE			
	6	TURN PAGE OVER			
	7	PLACE "V" ON UPPER RIGHT CORNER	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
	8	MOVE PAGE INTO SHIPPING BOX	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

DOTS OPERATORS: DOT PLACE

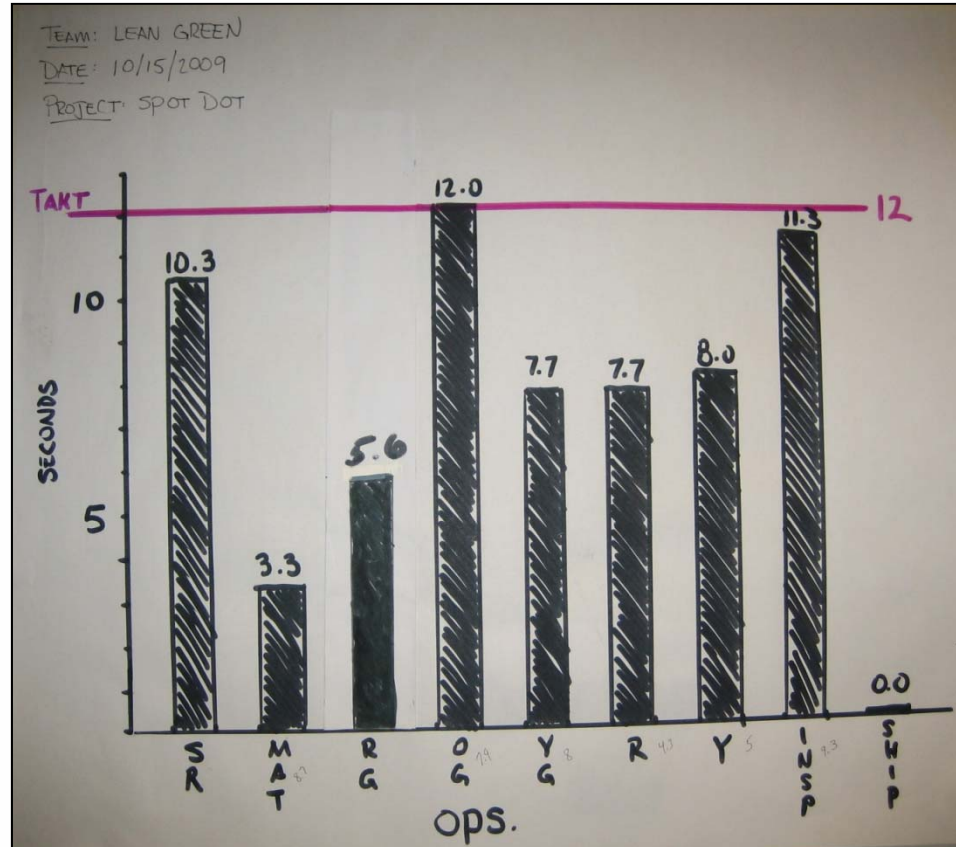
- 1) PEEL OFF DOTS
- 2) PLACE IN CENTER OF CIRCLES
- 3) PASS TO THE NEXT OPERATOR

* STOCK CAGE FILLED AND REPLENISHED BY SUPPLIER

Standard Sequence of Production for Consistent Product



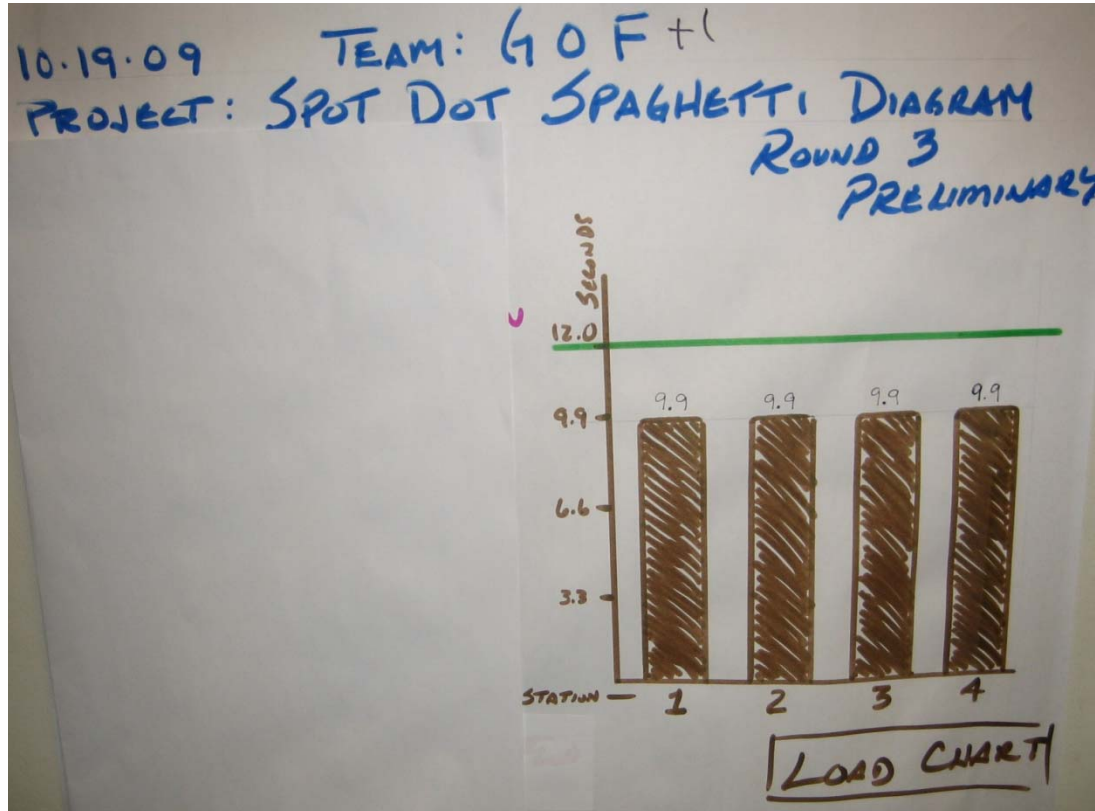
Baseline Load Chart



Currently Requires 9 Operators to Meet Customer Demand



Improved Load Chart



**Improved Process Eliminated 5 Operators
and Meets Customer Demand**



Spot Dot Work Cells

10/20/2009

DOT STREAM	GOF+I	HYBRID
+ 7' (2 DESKS)	- 15' (5 DESKS)	+ 3 TABLES + CHAIRS
+ GOLDEN UNITS	+ VENDOR MANAGED INVENTORY	+ 4 WORKERS
+ VENDOR MANAGED INVENTORY	+ 1 INSPECTION ✓ on back NO FOLD ≈ 2.5 SEC SAVED	+ GOLDEN UNITS
+ SIMPLE FLOW	+ MAINTENANCE	+ INSPECTION (✓ MARK)
- DOUBLE INSPECTION	+ 4 WORKERS	+ 11' DISTANCE
- NO MAINTENANCE	+ NO STAPLE	
- 5 WORKERS		
+ NO STAPLE		

Developed 2 Solutions and Combined Best Features of Both into a Hybrid Solution



Spot Dot Metrics

Metric	Baseline	Final	Comments
Available time	10	10	Minutes
# workers	9	4	
Time to 1st Del	3:04	0:45	Minutes
# Units produced	14	42	Finished Goods
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Questions?