



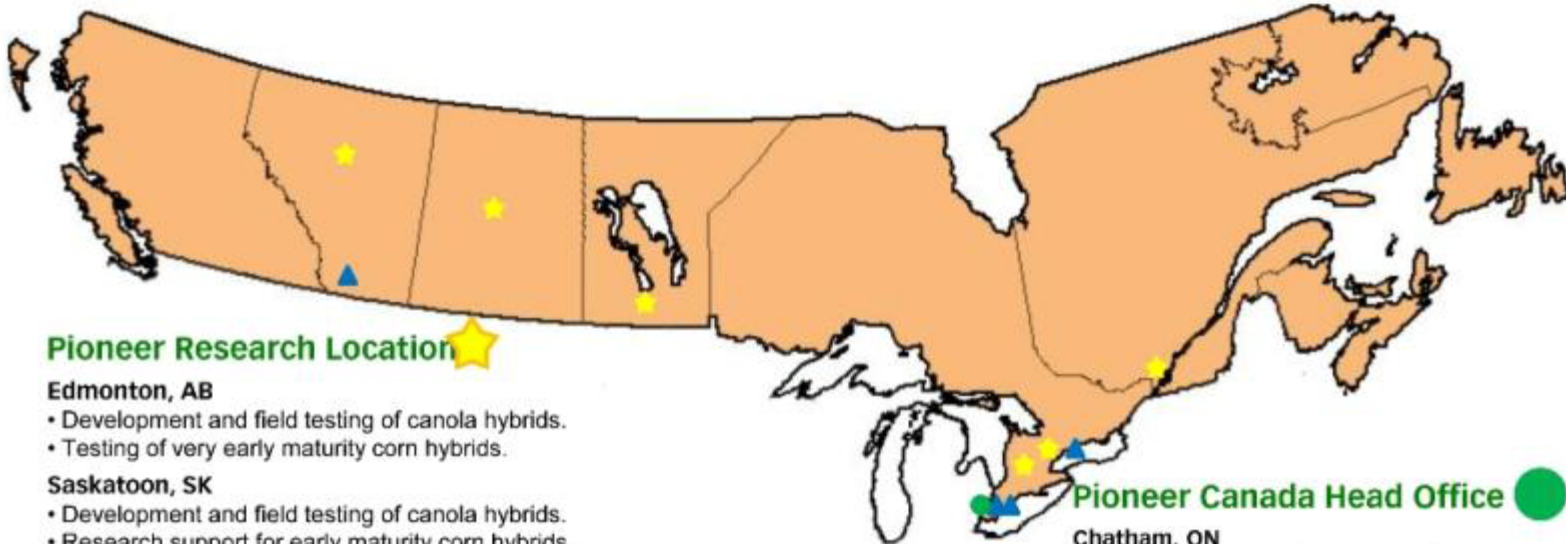
TRACC<sup>®</sup>

people • practices • results



**Pioneer Hi-Bred- Chatham  
Production Focused Improvement**

## Pioneer Hi-Bred Canada Locations



### Pioneer Research Location

#### Edmonton, AB

- Development and field testing of canola hybrids.
- Testing of very early maturity corn hybrids.

#### Saskatoon, SK

- Development and field testing of canola hybrids.
- Research support for early maturity corn hybrids.

#### Carman, MB

- Development and field testing of canola hybrids.
- Breeding and testing of early maturity corn hybrids and soybeans.
- Only corn breeding centre in Western Canada for all seed companies.

#### Tavistock, ON

- Development and testing of corn hybrids for Eastern Canada and northern US.

#### Woodstock, ON

- Development and testing of soybean varieties for Canada and northern US.

#### Georgetown, ON

- Global headquarters for Pioneer Hi-Bred's canola research activities. Includes 10,000 square feet of greenhouses and plot research field equipment.

#### Coteau-du-Lac, QC

- Corn, soybean and alfalfa plot research for Quebec.
- Development and testing of corn hybrids for Eastern Canada and northern US.

### Pioneer Canada Head Office

#### Chatham, ON

- Sales, marketing, HR, Admin and Finance

### Pioneer Productions Locations

#### Lethbridge, AB

- Constructed in 2007.
- Specifically designed to handle hybrid canola seed.

#### Chatham, ON

- Quality Assurance Laboratory.
- One of the largest seed conditioning plants in Canada.
- Produces, packages and ships corn, soybean & winter wheat.

#### Ridgetown, ON

- Supports Chatham plant in the seed production of corn, soybeans and winter wheat.

#### Georgetown, ON

- Canola parent seed conditioning plant.



**PIONEER**  
A DUPONT BUSINESS

Science with Service  
Delivering Success™

# Company in Brief



# Company in Brief



- In 1964, land was purchased where the current site is: one mile west of Chatham on Highway #2. By the end of 1967, Pioneer had constructed the most modern seed sizing facilities in the Canadian seed corn industry.
- In 1976, the seed production facility was expanded and improved.
- In 1981, land was purchased near Ridgetown, Ontario which eventually led to the construction of another new production plant there in 1982.
- Currently we produce and package corn, soybean and wheat seed at both Ridgetown (RID) and Chatham (CHA) locations and have approximately 130 employees year round, 200 for harvest in the fall and up to 4000 with detasseling crews in the fields for summer season.

# Our Site's Journey with TRACC



- DuPont Production System (DPS)  
kick-off-Oct.26/09
- Pilot Area:
  - Conditioning & Packaging Corn & Soybeans
- Implementation Task Force (ITF) and Site Steering Committee (SSC) began meeting in the fall of 2009
- Need for change:
  - Due to increased growth in employee population
  - Processes working 24/7
  - Reduce waste



### Chatham Location Vision Statement

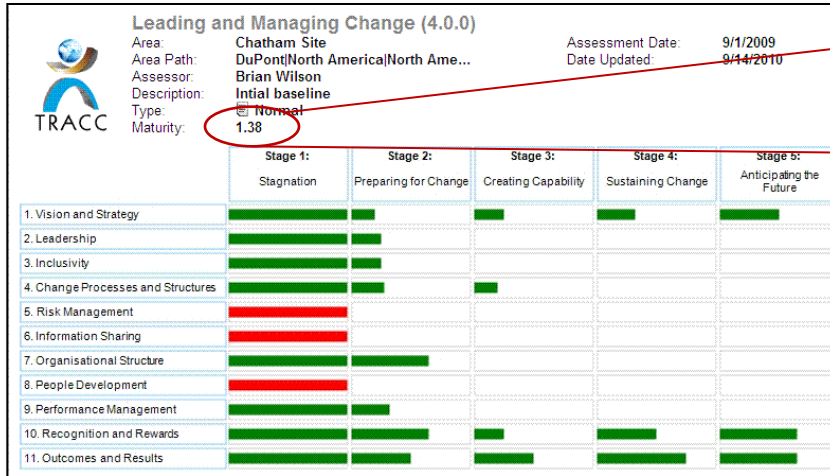
The Chatham Location will be the most reliable Canadian supplier of the highest quality products, exceeding both industry standards and customer expectations. Empowered, self directed teams will achieve this standard through employee motivation, innovation and active engagement. Within the next 5 years, we will improve all key metrics by 20%.

As of September 23, 2009

# Comparison of Baseline and Most Recent Practices Maturity Assessment Results



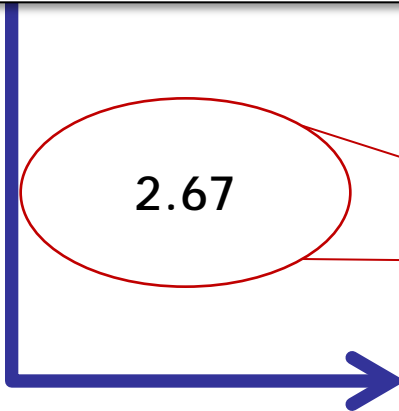
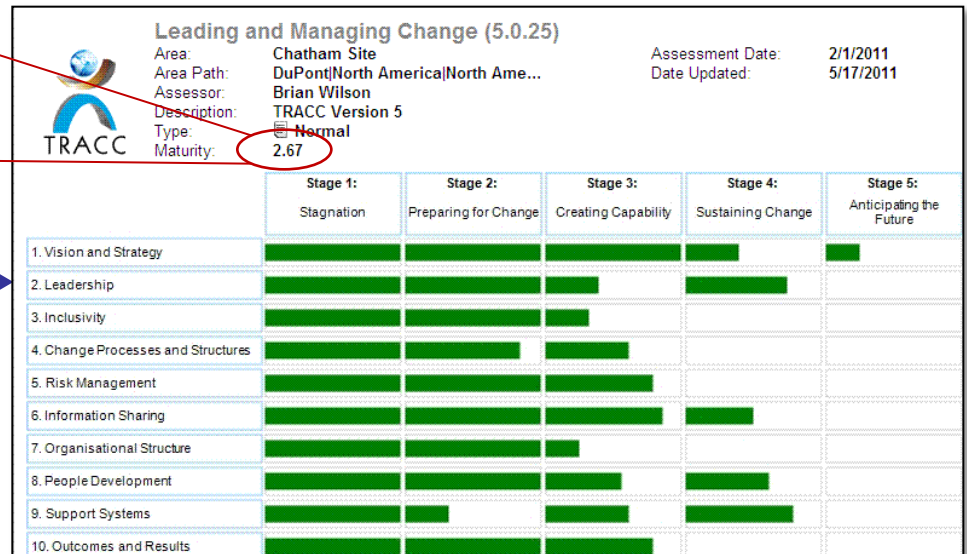
## Leading & Managing Change Baseline Assessment - Sep. 2009



1.38

## L&MC Most Recent Assessment - Feb. 2011

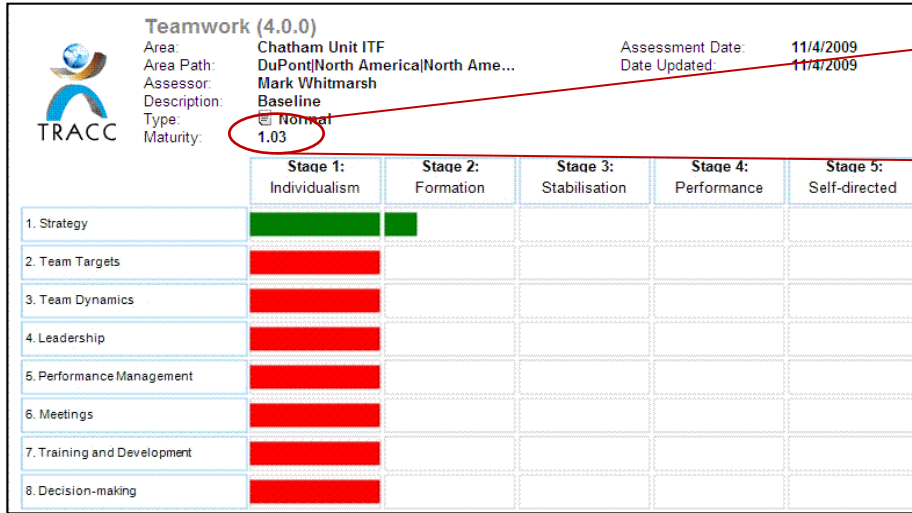
2.67



# Comparison of Baseline and Most Recent Practices Maturity Assessment Results (cont'd)



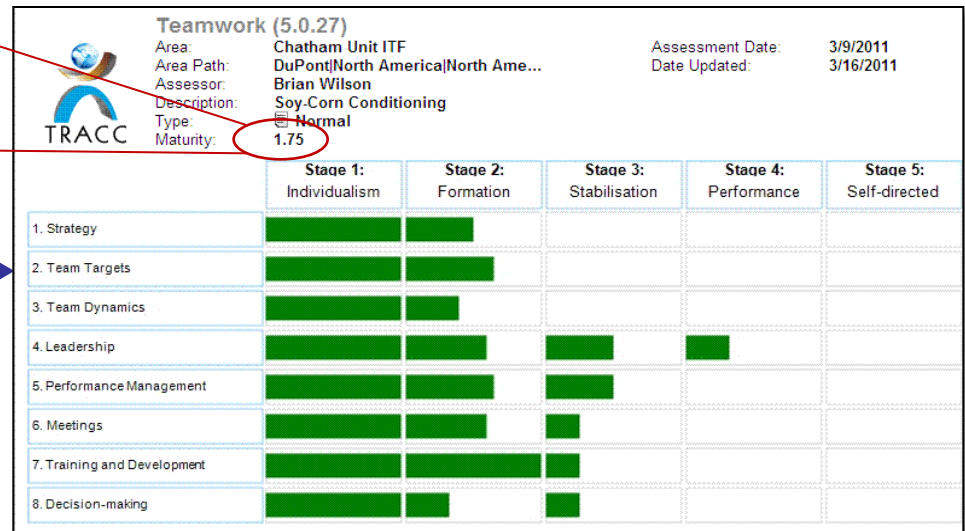
## Teamwork Baseline Assessment - Nov



1.03

## TW Most Recent Assessment - Mar 2011

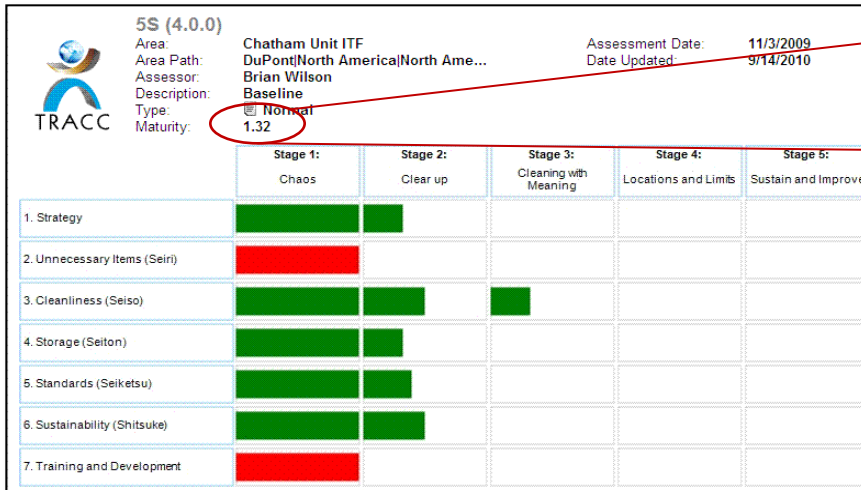
1.75



# Comparison of Baseline and Most Recent Practices Maturity Assessment Results (cont'd)



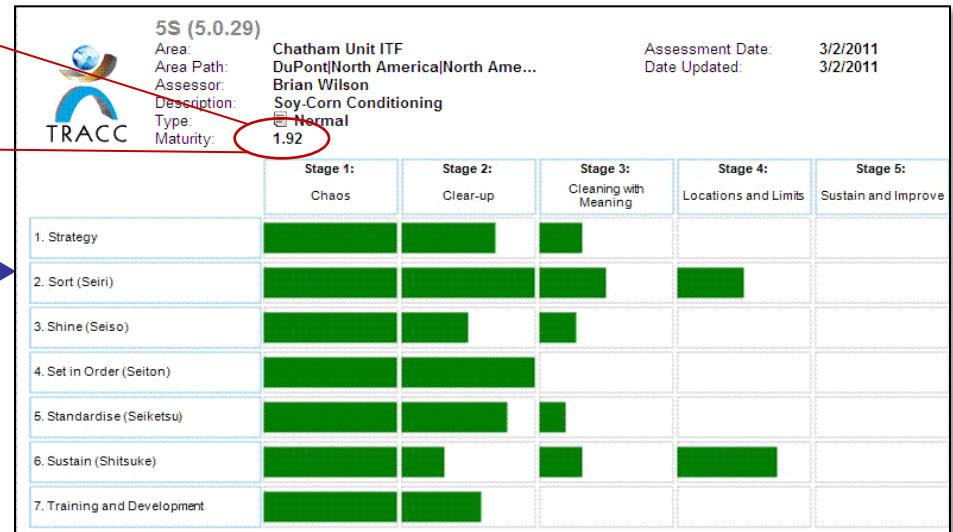
## 5S Baseline Assessment - Nov 2009



1.32

## 5S Most Recent Assessment - Mar 2011

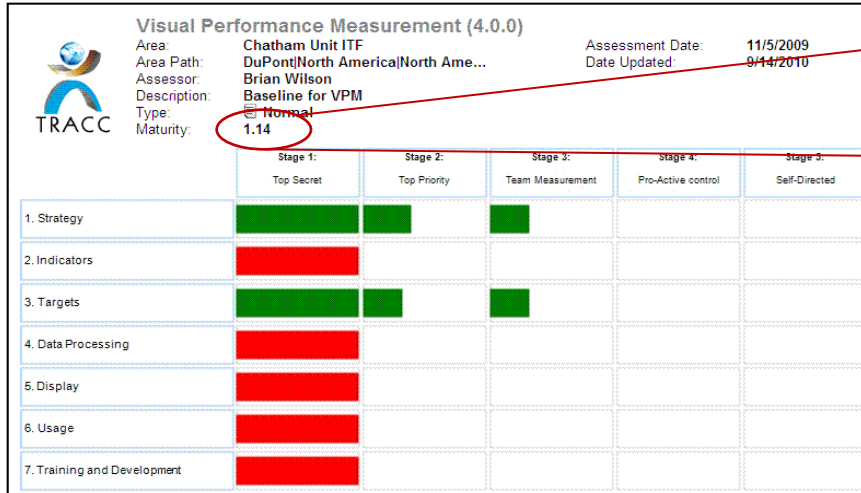
1.92



# Comparison of Baseline and Most Recent Practices Maturity Assessment Results (cont'd)



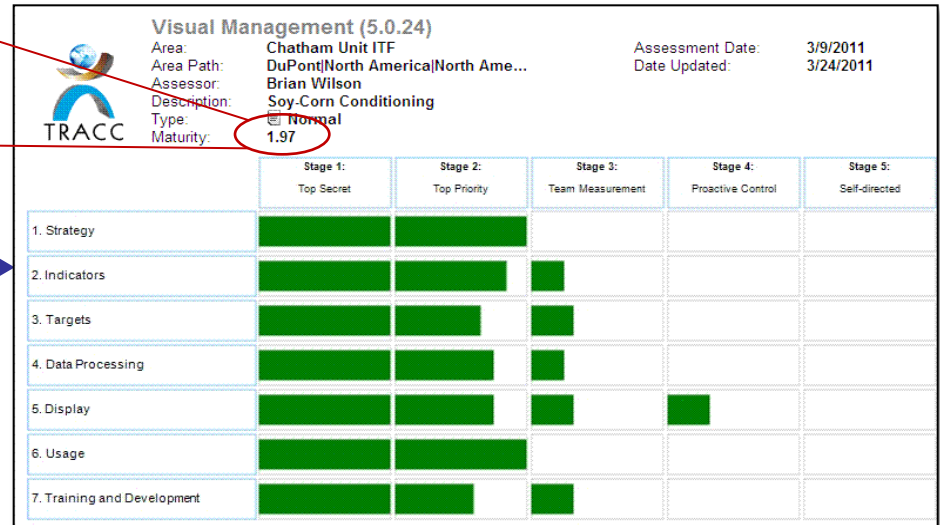
## Visual Management Baseline Assessment - Nov 2009



1.14

## VM Most Recent Assessment - Mar 2011

1.97



# Comparison of Baseline and Most Recent Practices Maturity Assessment Results (cont'd)



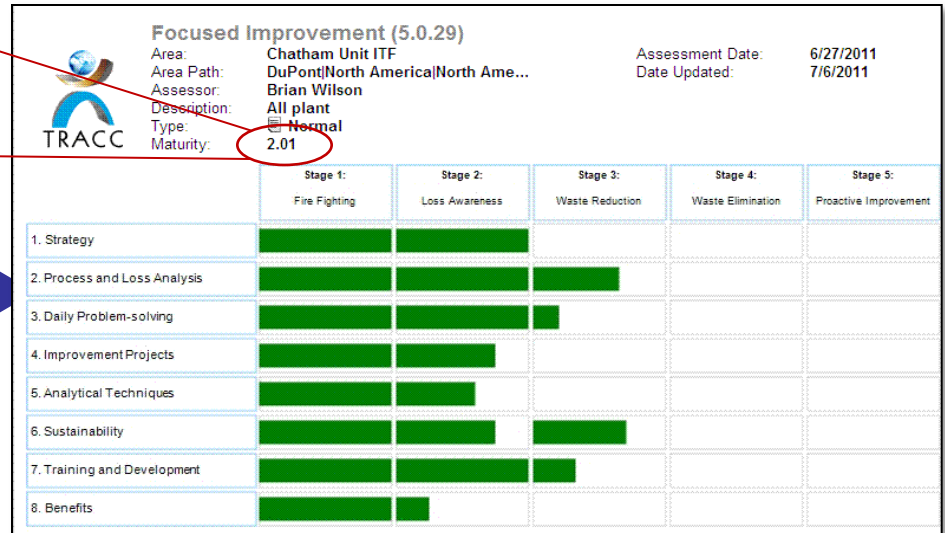
## Focused Improvement Baseline Assessment - Nov 2009



1.30

## FI Most Recent Assessment - Mar 2011

2.01



- Background:
  - CHA had the opportunity to start to work on LEAN projects within the plant since 2007
  - Prior to kick-off approximately 30+ projects/kaizens were completed including 5S and Single Minute Exchange of Die (SMED)
  - Some 'low hanging fruit' was harvested (examples to follow)
  
- Problem:
  - Projects were specific and not always team oriented
  - Follow-up on projects inconsistent - execution issue

# CHA-ProBox Repair 5S

Duane Deprez, Marc Randall, Bob Dakin, Kevin Alberts, Anna Hildebrand, Allen Woodrich, Brian Wilson-June 2008



**Problem:** ProBox repair parts not all clearly labeled and stored in various containers in repair area making them difficult to locate



**Problem Analysis:** Time to find all parts took in excess of 20 minutes

## Implementation Plan:

- Make only standard size parts to use as repair parts
- Create labeled storage area for each part
- Create kanban system to quickly view when restocking of parts is required

## Results:

- Time to find all parts: less than 20 seconds
- Side and Front parts labeled and easy to access
- Kanban ensures a supply of parts are always available



**Future Steps:**  
Monitor kanban  
Monitor Sustain

# CHA-RID Harvest Sheller SMED

Neal Revell, Don Burgess, Mark  
Coatsworth, Leon Dorssers, Barb  
Cowan, Brian Wilson. Oct.-2008



**Problem:** Changeovers are taking a long time



## **Problem Analysis:**

- Current time for changeover: 50 min
- Operators know the process but difficult to pass information on without written documentation

## **Implementation Plan:**

- Create a Standard Work Procedure for Dryer Unloading Operators and Sheller Operators
- Greater use of air to clean instead of brooms
- Elimination of 'hard to clean' areas

## **Results:**

- Final time: 20 min

## **Future Steps:**

- Change gates on Shellers to clean out easier
- Change collector head cover to make easier to clean

- Case Study Issue: How to make the Implementation Action's (IA) and Stop & Think's (S&T) in the best practice of Focused Improvement work for Chatham Production.
- Needed to do this in order to help all team members at the CHA plant understand where and how each of the IA's and S&T's fit into the overall picture of FI.
- Need to have names attached to process for accountability

# Action Taken - Problem Solving Process Flow



*We created a detailed process flow chart that defines how projects get generated, triaged, and executed:*

- ✓ Created by FI Best Practice Champions on ITF and SSC
- ✓ Builds on Focused Improvement Flow Diagram in 2IA2
- ✓ Incorporates elements of VM and Teamwork
- ✓ Includes tiers of problem solving - attempt to align projects with the right resources (situational, systemic, strategic)
- ✓ Process Flow was communicated to all Team members in FI Team training on Loss and Waste Awareness
- ✓ Adds in specific responsibilities for increased accountability



# Detailed Problem Process Flow Review

**PROBLEM on shop floor identified – Ex.**  
 - look / listen/ feel  
 - KPI targets not met

discussed at Team WB Meeting

SS identifies type of problem

SS discusses problem with TEAM

problem taken by SS to all shifts for feedback

possible problem solutions shared with all shifts

problem solved by Team (on the event)

SS adds problem to Project Hopper by Area

situation problem?

problem solved by TEAM

systemic problem?

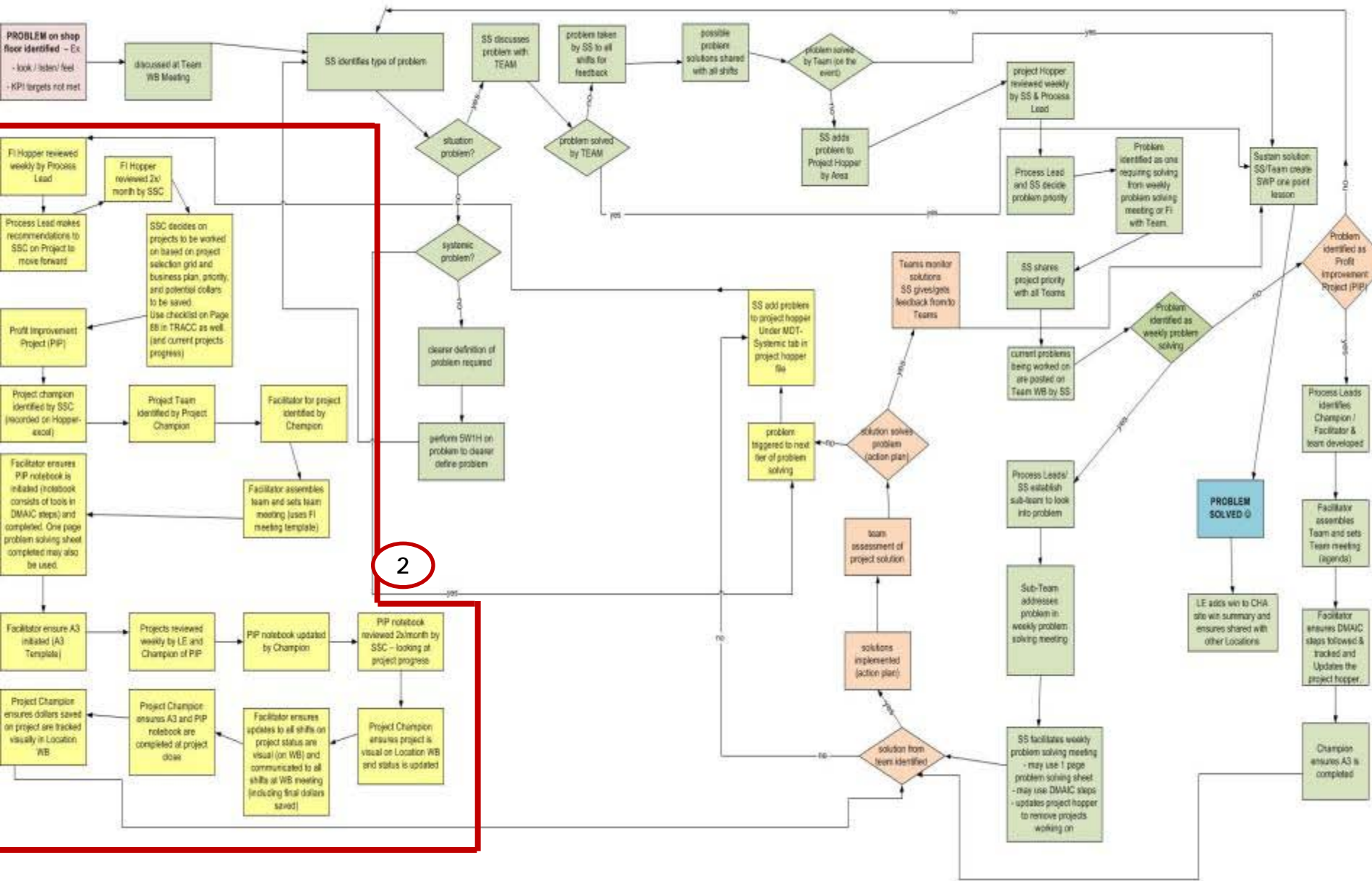
clearer definition of problem required

perform 5W1H on problem to clearer define problem

Ridgetown Rework Project Hopper	
Date	Project Title
03\30\11	small batches
04\01\11	switching product line
04\04\11	had to stop to clean up fallen product
04\08\11	packaging line broke down
04\08\11	palletizer had skid go in off center \ switch left off
04\13\11	all employee meeting
04\13\11	Entire Rid Network down.No computers No RF units

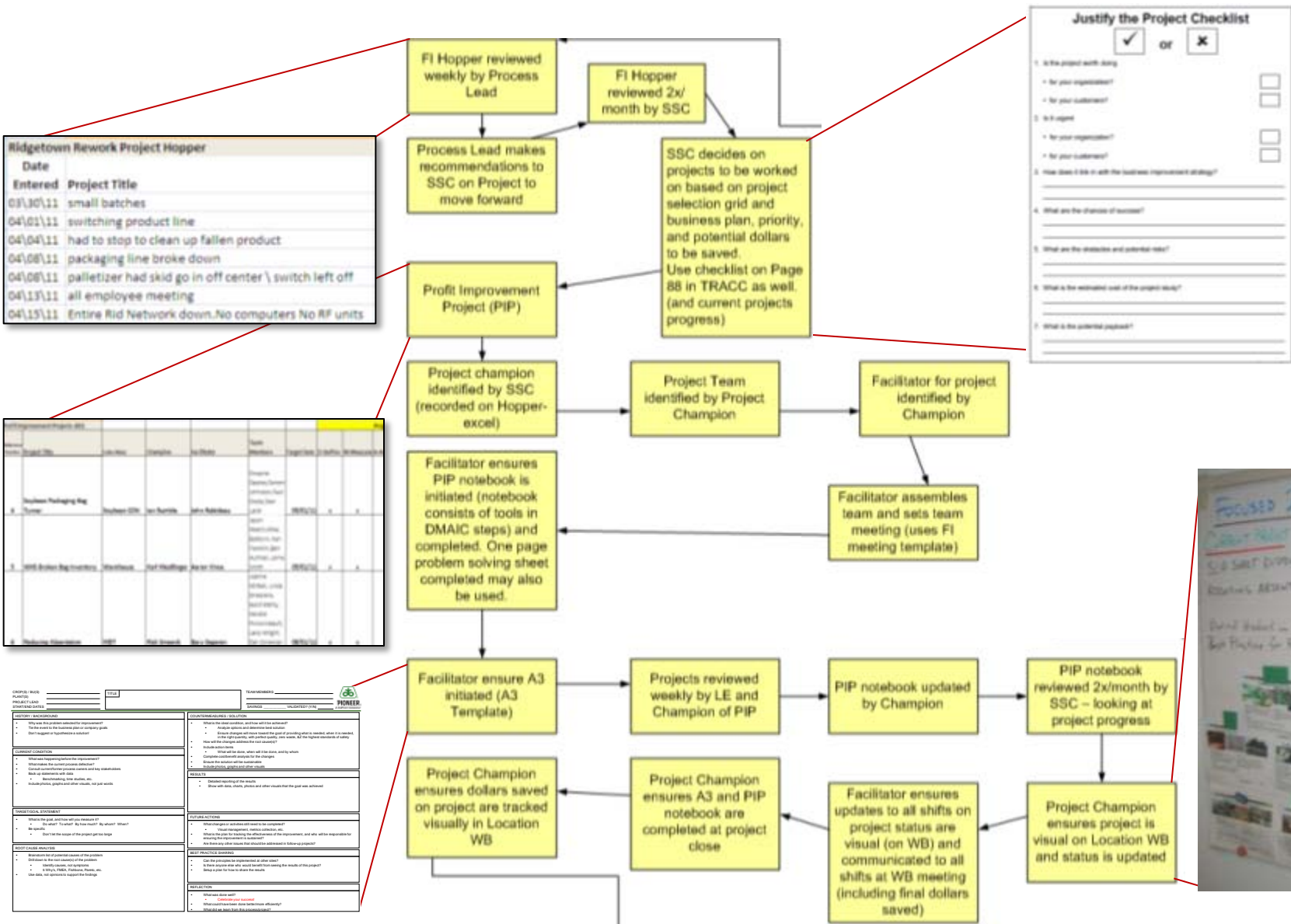


# CHA PROBLEM PROCESS FLOW



2

# Detailed Problem Process Flow Review (cont'd)



**Ridgetown Rework Project Hopper**

Date	Project Title
03\30\11	small batches
04\01\11	switching product line
04\04\11	had to stop to clean up fallen product
04\08\11	packaging line broke down
04\08\11	palletizer had skid go in off center \ switch left off
04\13\11	all employee meeting
04\13\11	Entire Rid Network down.No computers No RF units

**Empowerment Project 2011**

Project Title	Who	Where	Complete	By Date	Name	Department	Project Start	Project End	Project Status
Business Packaging Bag	Tommy	Production 200	Tommy, Michelle	John, Kathleen	John	Production	03/27/11	04/01/11	Completed
2011 Business Bag Initiative	John, Kathleen	Production 200	John, Kathleen	John, Kathleen	John	Production	03/27/11	04/01/11	Completed

**PIERCE**

DATE: \_\_\_\_\_ TITLE: \_\_\_\_\_ TEAM MEMBERS: \_\_\_\_\_

PROJECT LEAD: \_\_\_\_\_ PROJECT START: \_\_\_\_\_ PROJECT END: \_\_\_\_\_

**ACTIVITY BACKGROUND**

What is the problem or opportunity?  
 Why has this problem/opportunity occurred?  
 How has this problem/opportunity impacted the business?  
 How important is this problem/opportunity?

**CURRENT CONDITIONS**

What are the current conditions?  
 How long has this problem/opportunity existed?  
 How has this problem/opportunity impacted the business?  
 How important is this problem/opportunity?

**PROPOSED SOLUTION**

What is the proposed solution?  
 How long will it take to implement?  
 How much will it cost?  
 How will it be implemented?  
 How will it be communicated to all shifts?  
 How will it be tracked?  
 How will it be updated?  
 How will it be reviewed?  
 How will it be communicated to all shifts?  
 How will it be tracked?  
 How will it be updated?  
 How will it be reviewed?

**Justify the Project Checklist**

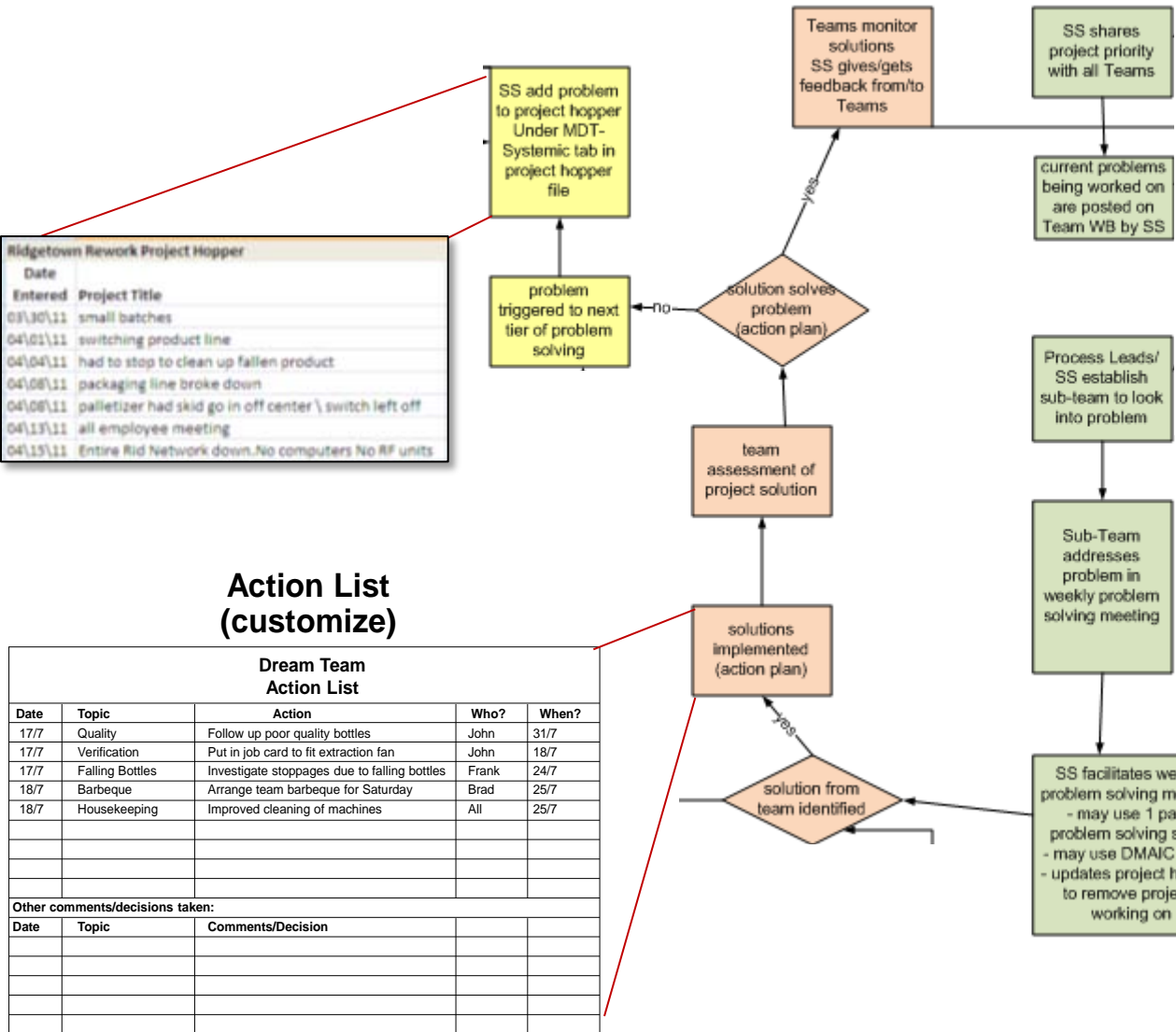
or

- Is the project worth doing?
  - For your organization?
  - For your customer?
- Is it urgent?
  - For your organization?
  - For your customer?
- How does it fit in with the business improvement strategy? \_\_\_\_\_
- What are the chances of success? \_\_\_\_\_
- What are the obstacles and potential risks? \_\_\_\_\_
- What is the estimated cost of the project itself? \_\_\_\_\_
- What is the potential payoff? \_\_\_\_\_





# Detailed Problem Process Flow Review (cont'd)



Bidgetown Rework Project Hopper	
Date	Project Title
03\30\11	small batches
04\01\11	switching product line
04\04\11	had to stop to clean up fallen product
04\06\11	packaging line broke down
04\06\11	palletizer had skid go in off center \ switch left off
04\13\11	all employee meeting
04\15\11	Entire Rid Network down.No computers No RF units.

## Action List (customize)

Dream Team Action List				
Date	Topic	Action	Who?	When?
17/7	Quality	Follow up poor quality bottles	John	31/7
17/7	Verification	Put in job card to fit extraction fan	John	18/7
17/7	Falling Bottles	Investigate stoppages due to falling bottles	Frank	24/7
18/7	Barbeque	Arrange team barbeque for Saturday	Brad	25/7
18/7	Housekeeping	Improved cleaning of machines	All	25/7
Other comments/decisions taken:				
Date	Topic	Comments/Decision		

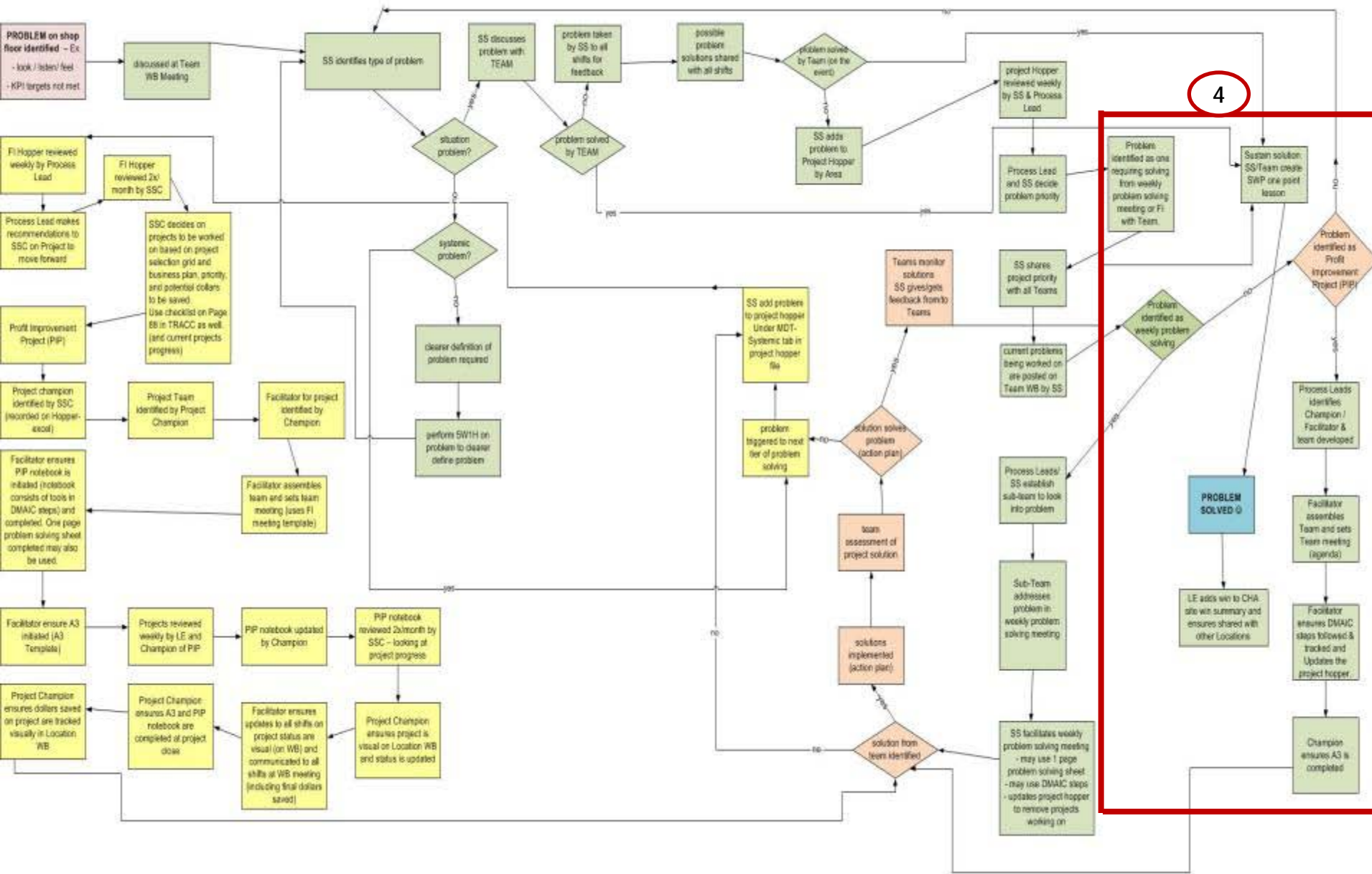
### Examples

#### One-page problem-solving sheet

**21A2**

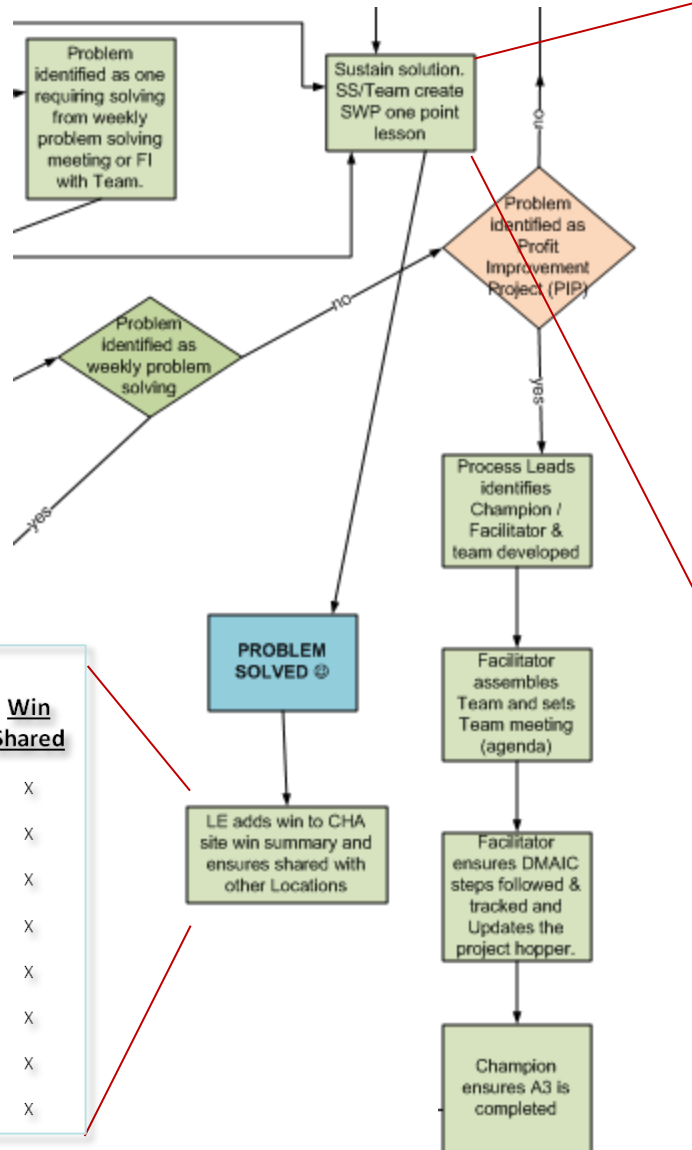
Plan	Participants
<b>Step 1: Define the problem</b> What? Where? When? Who? Which trend? How big?	
<b>Step 2: Measure - Information and Data</b>	
<b>Step 3: Analyze and find the root cause(s)</b>	
Why:	Why:
Why:	Why:
Why:	Why:
Why:	Why:
Why:	Why:
<b>Root cause</b>	
<b>Step 4: Improve - Solution Diagram or Description</b>	
<b>Step 5: Control - Confirm Result - improvement</b>	
Action Plan	
What:	Who? When?
<input type="checkbox"/> One point lesson <input type="checkbox"/> 5P <input type="checkbox"/> 8D Schedule <input type="checkbox"/> Troubleshooting Diagram <input type="checkbox"/> Training <input type="checkbox"/> Risk Table <input type="checkbox"/> Modification	

# CHA PROBLEM PROCESS FLOW



4

# Detailed Problem Process Flow Review (cont'd)



**Bulk Intake Changeover - Cleaner** CHA-BLK-INT

**Reminders**

	See Task & Intake list		Lockout/Tagout		Person in safety gear		Additional REQUIRED PPE		Quality Checks
	Headphones		Warning sign		Warning sign		Special sign		Assist in another Area
	Other Expectations		Tolerance		Flared		Gages		Special note

**Overview** Instructions & Explanations Target 9 Min - Overview steps 1&2

1. Clean Intake Area

1.1 Air clean intake grate and hopper

1.2 Ensure hopper is clean (conveyor and leg are running).

Date	Plant	Win Description	\$ Amount	Win Documented	Win Shared
Dec 1, 2010	CHA/RI D	Discard product	\$40,000.00	X	X
Apr 24, 2011	RID	Palletizer Roller	Soft \$	X	X
May 7, 2011	CHA	FI-Seed Counter	N/A	X	X
May 7, 2011	CHA	Treater Shift Notes	Soft \$	X	X
May 7, 2011	CHA	FI-Warehouse-Broken Bags	Soft \$	X	X
May 7, 2011	CHA	Shift Supervisors and employee placement	Soft \$	X	X
May 9, 2011	CHA	Packaging -Empty ProBoxes and Pallets inventories	Soft \$	X	X
May 7, 2011	CHA	FI-Soybean Packaging Bag Turner	\$89,116.00	X	X

# Team Whiteboard (WB)



# Project Hopper



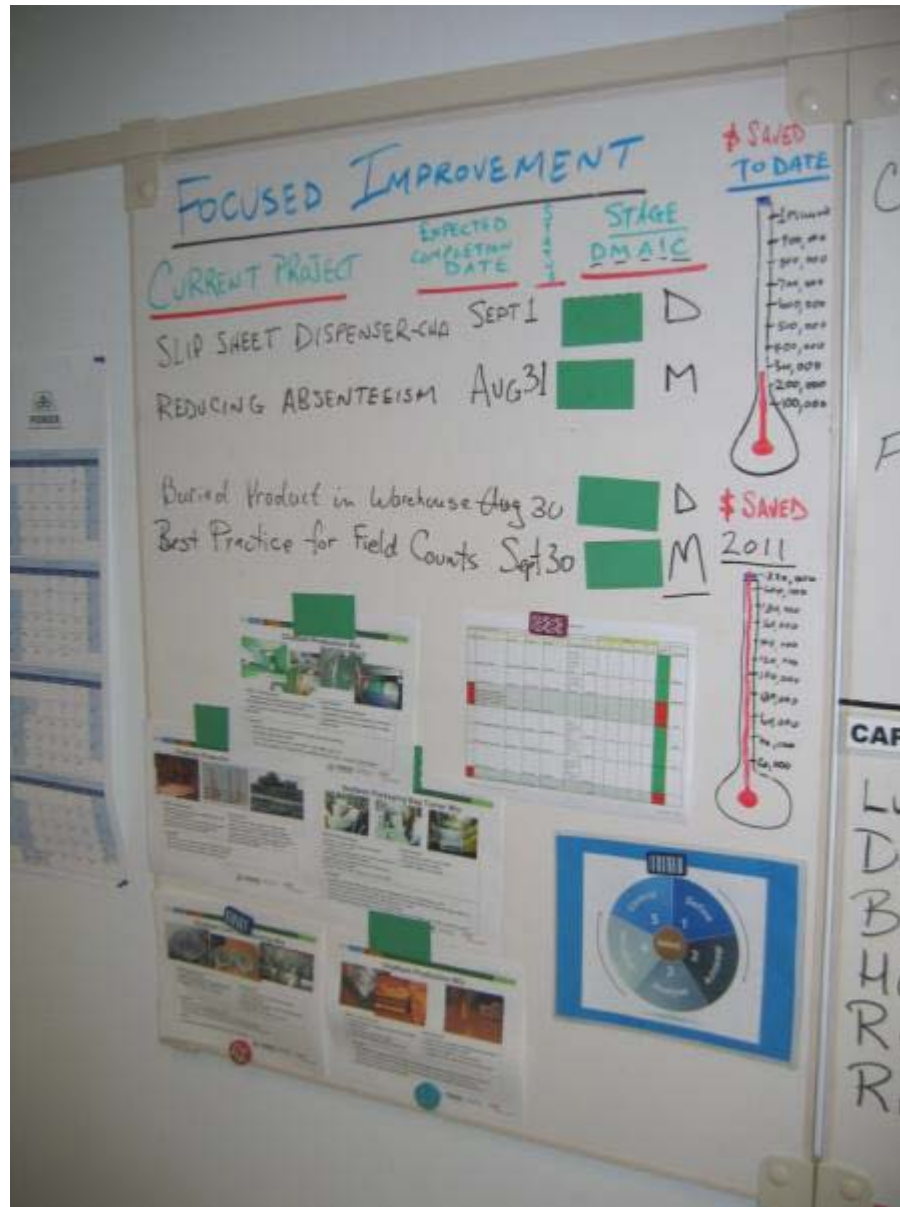
	A	B	C	D	E
1	<b>Ridgetown Rework Project Hopper</b>				
	<b>Date</b>				
2	<b>Entered</b>	<b>Project Title</b>	<b>Problem Type: Sytemic/Situational</b>	<b>Additional Information to help define project</b>	
3	03\30\11	small batches	systemic	required to run 20 bags and under	
4	04\01\11	switching product line	systemic	have to fulfill our obligation to sales	
5	04\04\11	had to stop to clean up fallen product	situational	rmi stacked to high and fell over	
6	04\08\11	packaging line broke down	systemic	bag magazine won't run smoothly	
7	04\08\11	palletizer had skid go in off center \ switch left off	systemic\situational	operator didn't notice switch off\ Leon called in to fix	
8	04\13\11	all employee meeting	systemic		
9	04\15\11	Entire Rid Network down.No computers No RF units	systemic	at&t line problem	
10	04\18\11	bagging line malfunction	systemic	load cell failure\ no spares kept	
11	04\21\11	switching product line	systemic	have to fulfill our obligation to sales	
12	04\25\11	bagging line malfunction	systemic	load cell failure\ no spares kept	
13	04\26\11	bagging line malfunction	systemic	load cell failure\ no spares kept	
14	04\27\11	down for clean up for bagging line upgrade	systemic	protocol before work performed	
15	04\28\11	shut down while upgrading	systemic	scheduled down time	
16	05\02\11	shut down while upgrading	systemic	scheduled down time	
17	05\09\11	waiting for pssr on newlong bagger	systemic	protocol before work performed	
18	05\10\11	return leg gear box broke(being replaced)	systemic	patched for a few years	
19	05\11\11	waiting on new gear box to arrive	systemic	no replacement for unit(have three identical ones upstai	
20	05\12\11	waiting on new gear box to arrive	systemic	no replacement for unit(have three identical ones upstai	
21	05\13\11	new gear box arrived, being installed	systemic	no replacement for unit(have three identical ones upstai	
22					
23					
24					
25					

# Improvement Project Tracking



	A	B	C	D	E	F	G	H	I	
1	Profit Improvement Projects-2011							Prog		
2	Reference Number	Project Title	Loss Area	Champion	Facilitator	Team Members	Target Date	D-Define	M-Measure	A-An
6	4	Soybean Packaging Bag Turner	Soybean CON	Ian Rumble	John Rabideau	Dwayne Deprez, Eamon Johnston, Paul Doyle, Stan Larsh	05/01/11	x	x	
7	5	WHS Broken Bag Inventory	Warehouse	Karl Meidlinger	Aaron Vince	Jason Martin, Mike Baldwin, Ken Franklin, Ben Authier, Lorne Smith	05/01/11	x	x	
8	6	Reducing Absenteism	MDT	Rick Smeenk	Gary Segeren	Joanne McNeil, Linda Driessens, Gord Wathy, Kendra Pinsonneault, Larry Wright, Dan Zonervan	08/01/11	x	x	

# Visual Display of Problem Solving Efforts & Gains



# A3 Template



**PIONEER**  
A DUPONT COMPANY

CROP(S) / BU(S) \_\_\_\_\_  
 PLANT(S) \_\_\_\_\_  
 PROJECT LEAD \_\_\_\_\_  
 START/END DATES \_\_\_\_\_

TITLE	
-------	--

TEAM MEMBERS \_\_\_\_\_  
 \_\_\_\_\_  
 SAVINGS \_\_\_\_\_ VALIDATED? (Y/N) \_\_\_\_\_

<b>HISTORY / BACKGROUND</b> <ul style="list-style-type: none"> <li>Why was this problem selected for improvement?</li> <li>Tie the event to the business plan or company goals</li> <li>Don't suggest or hypothesize a solution!</li> </ul>
---

<b>CURRENT CONDITION</b> <ul style="list-style-type: none"> <li>What was happening before the improvement?</li> <li>What makes the current process defective?</li> <li>Consult current/former process owners and key stakeholders</li> <li>Back up statements with data                             <ul style="list-style-type: none"> <li>Benchmarking, time studies, etc.</li> </ul> </li> <li>Include photos, graphs and other visuals, not just words</li> </ul>
--

<b>TARGET/GOAL STATEMENT</b> <ul style="list-style-type: none"> <li>What is the goal, and how will you measure it?                             <ul style="list-style-type: none"> <li>Do what? To what? By how much? By whom? When?</li> </ul> </li> <li>Be specific                             <ul style="list-style-type: none"> <li>Don't let the scope of the project get too large</li> </ul> </li> </ul>
---

<b>ROOT CAUSE ANALYSIS</b> <ul style="list-style-type: none"> <li>Brainstorm list of potential causes of the problem</li> <li>Drill down to the root cause(s) of the problem                             <ul style="list-style-type: none"> <li>Identify causes, not symptoms</li> <li>5 Why's, FMEA, Fishbone, Pareto, etc.</li> </ul> </li> <li>Use data, not opinions to support the findings</li> </ul>
---

<b>COUNTERMEASURES / SOLUTION</b> <ul style="list-style-type: none"> <li>What is the ideal condition, and how will it be achieved?                             <ul style="list-style-type: none"> <li>Analyze options and determine best solution</li> <li>Ensure changes will move toward the goal of providing what is needed, when it is needed, in the right quantity, with perfect quality, zero waste, &amp;Z the highest standards of safety</li> </ul> </li> <li>How will the changes address the root cause(s)?</li> <li>Include action items                             <ul style="list-style-type: none"> <li>What will be done, when will it be done, and by whom</li> </ul> </li> <li>Complete cost/benefit analysis for the changes</li> <li>Ensure the solution will be sustainable</li> <li>Include photos, graphs and other visuals</li> </ul>
--


<b>RESULTS</b> <ul style="list-style-type: none"> <li>Detailed reporting of the results</li> <li>Show with data, charts, photos and other visuals that the goal was achieved</li> </ul>
---

<b>FUTURE ACTIONS</b> <ul style="list-style-type: none"> <li>What changes or activities still need to be completed?                             <ul style="list-style-type: none"> <li>Visual management, metrics collection, etc.</li> </ul> </li> <li>What is the plan for tracking the effectiveness of the improvement, and who will be responsible for ensuring the improvement is sustained?</li> <li>Are there any other issues that should be addressed in follow-up projects?</li> </ul>
---

<b>BEST PRACTICE SHARING</b> <ul style="list-style-type: none"> <li>Can the principles be implemented at other sites?</li> <li>Is there anyone else who would benefit from seeing the results of this project?</li> <li>Setup a plan for how to share the results</li> </ul>
--

<b>REFLECTION</b> <ul style="list-style-type: none"> <li>What was done well?                             <ul style="list-style-type: none"> <li>Celebrate your success!</li> </ul> </li> <li>What could have been done better/more efficiently?</li> <li>What did we learn from this process/project?</li> </ul>
--

# Sample Work Instruction



















**PIONEER**  
A SAFETY BRAND

## Bulk Intake Changeover - Cleaner










## CHA-BLK-INT

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### Reminders

 PSSSR & NEO	 See Tools & material lists	 Lockout/Tagout	 Picture in column on right	 Additional REQUIRED PPE	 Quality Checks
 Visual Inspection	 1 Warning note	 2 Warning note	 1 Special note	 2 Special note	 Assist in Another Area
 Other Expectations	 1 Reference	 1 Record	 Goggles		

Overview	Instructions & Explanations	 Target 9 Min –Overview steps 1&2
<p style="color: orange;">1. Clean Intake Area</p>	<p>1.1 Air clean   1 intake grate and hopper.   </p> <p>1.2 Ensure hopper is clean   (conveyor and leg are running).</p>	<p style="color: orange;">1</p> 

# Implementation Challenges



## I. Execution

- Following timelines in CHA Problem Process Flow
- Needed problems identified and placed in Project Hopper
- Scheduled reviews were easy to delay

## II. Communication

- Team not fully understanding why a particular project was selected when there are other perceived “bigger problems” that we should be working on
- Communicating updates to all team members

## III. Behavior Change

- Getting Started
- FI Team wants to jump to conclusion too quickly without going through all steps in a FI project
- Celebrate success-we need to get better at this

# Some Results to Share



- Chatham Production Wins!
- Affected Key Performance Indicators (KPIs):
  - Improved Safety
  - \$\$\$ Saved
  - Increased Productivity
  - Increased Morale
- Wins are shared with other sites
- TRACC scores increase

# Chatham Production Win



## Before improvements:

- Soybeans were discarded due to treatment causing product to adhere to conveyor
- Total cost of product discarded per week is \$6,708.61

## Improvement:

- Reformulation of treatment
- Installation of tension scraper on conveyor
- Installation of mineral oil applicator inside treater drum

## Benefits:

- Improved uptime for productivity through less time cleaning
- Increased employee morale
- Loss of product reduced to less than 1 unit /7000 units ran
- Total cost savings of \$130,540.52 in saleable product over 1 season of packaging

# Chatham Corn Conditioning Win



## Before improvements:

- Downtime accumulated for Packaging Operator waiting for Treater Operator to finish counts
- Average time to do counts: 14 minutes

## Improvement:

- Cones built inside the bowls of the counters
- Bowls sandblasted
- Standard Work Procedure created to make process the same across all shifts
- Average time to do counts: 6 minutes

## Benefits:

- Reduces time to do counts by over 50%
- Communication improved between Treater and Packaging Operator
- Time savings on overall improvements to process calculated at 24 minutes

## Value:

- Potential to increase productivity by 15,120 units/week

- After the initial FI training there were people who were still skeptical of whether we would really begin to address problems
- However, after doing and sharing/showing results more people bought into the fact that this might actually be doing something
- We had employees who did not want to be involved in FI projects now asking if they could be involved in other aspects of DPS (Theme Teams, ITF, Production Coordinators)

# Response from Employees (cont'd)

One employee's response - At the end of the treater project one treater operator made a comment referring to coming to work each day now...



# Lessons Learned



- Follow the IA's laid out in TRACC
- Create a FI process flow that works for your site
- Empower and ensure people are accountable
- Create a 'Project Hopper' to capture the reasons why daily goals were not achieved
- Projects align with Business Goals
- Follow the DMAIC (Six Sigma) steps-resist the temptation to jump ahead
- Communicate to the rest of the team in more than one way on project progress and results-remember to celebrate the win!
- Always consider how dollars are attached to the win and validate these dollars with Finance
- Share the win with others
- Follow up with project to ensure win stays in place Plan, Do, Check, Act (PDCA)

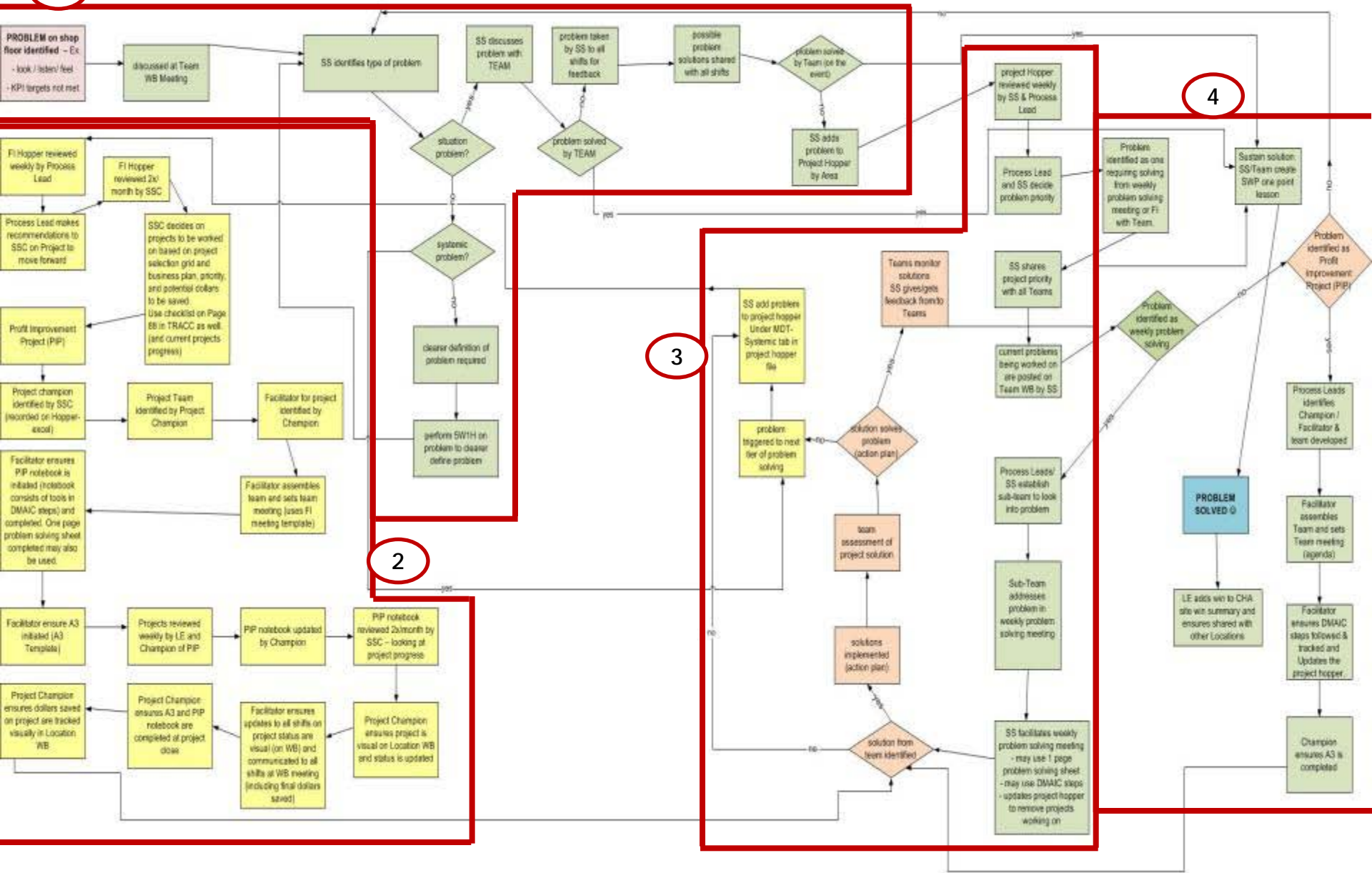
# Small Group Breakout Session



1. Get together at your tables and review each of the 4 sub-sections of the flow chart (shown again on next slide).
2. For each sub-section, answer the following questions:
  - Which steps in this portion of the flow chart will be most difficult to execute consistently and why?
  - What can you do to help the site overcome these challenges?
  - Which steps in this portion of the flow chart will provide the most value to the site if they were to be executed consistently?
3. Summarize the key discussion points and assign someone to report out to the other groups.
4. Take 5 minutes on your own to write up the list of people who would need to be involved in designing and executing a problem solving process flow for your site.

# CHA PROBLEM PROCESS FLOW

1



4

3

2